American Railroad Journal.

WHOLE NO. 2,577.] NEW YORK, JUNE, 1886. [VOLUME LX.—NO. 3.

SELECTION AND PROMOTION OF RAILWAY EMPLOYES.

BY WM. S. HUNTINGTON.

[Written for the AMERICAN RAILROAD JOURNAL.]

A GREAT deal has been said and written of late in regard to what may be termed "railway civil service reform," the object of which is to secure a more efficient corps of employés in every department of railway service. That the greatest care should be exercised in the selection of men for responsible positions is admitted by every one, but there are not a few who do not approve of the methods now being adopted by some of the leading roads for testing the efficiency of skilled operatives, or those who fill positions of great responsibility. The disapproval is not confined to candidates for employment as new applicants, or promotion of old employés, but prominent retired railway officials and successful managers of large business and manufacturing enterprises disapprove of the iron-clad examinations, or "sweating process," applicants for positions must suffer at headquarters. So long as the examinations are confined to questions on subjects connected with the duties the applicant is expected to perform, there is no ground for complaint, but when an aspirant for an ordinary operative's position has questions fired at him that would stagger a college professor, and are entirely foreign to the business in hand, it seems like a very silly proceeding and a waste of valuable time. The idea that a locomotive runner must be well up in the higher mathematics and able to tackle all the problems of Euclid, be well versed in all manner of 'isms and 'ologies, and be literally crammed with learning, is not popular with many of the oldest superintendents of motive-power, and they are satisfied with a runner who thoroughly understands his business and pays strict attention to it, and with them a finished education is of secondary importance.

I have before me a letter from a young man who some time since graduated from a telegraph college. When he left the institution he expected immediate employment in a telegraph office, but as he has only gained a "school knowledge" of the art, he is now going into a Western Union office to get a practical training, when his services will be likely to be in demand. Another man who graduated as an electric engineer, applied for employment at the office of a telegraph superintendent. When asked what he could do he replied that he had a thorough knowledge of electric engineering and could do anything in that line. The superintendent asked him if he could dig a hole, put a pole into it and shin to the top and wire it. He replied that that was not practiced where he was educated, and he was not wanted.

A graduate of an agricultural college applied to a thrifty farmer for employment. He understood agricultural chemistry; could analyze soils and fertilizers in great shape. The farmer wanted his ground plowed before he had any use for a chemist, and as the applicant had not learned to plow he had to look elsewhere for employment. These instances are not cited as proof that education is not desirable, but to show that the standard of excellence should not be measured by the number of languages a man can talk or the knotty problems he can solve, and that it is irrational and wasteful of time to drill men on questions of whose meaning they have no idea, and which they will never have occasion to use or understand. The only benefit that can be derived from the ability to answer all puzzling questions, an applicant may have put to him outside of matters pertaining to his calling is, that it shows the man to be intelligent, and can grasp ideas readily, but this can be as readily ascertained by confining the examination to pertinent questions that both the applicant and his employers would profit by. It is eminently proper for railway managers to improve the *status* of their operatives, but it has been clearly shown in the experience of many of the leading American railway managers that their best men are not those who are loaded down with a knowledge of a thousand-and-one things that are in no way connected with their duties, but who give their undivided attention to what is *necessary for them to know*, in order to be masters of the situation and enable them to perform their duties in a satisfactory manner. The color-blind craze of a few years ago resulted in the discovery that many of the oldest, safest and most trusty engineers were color blind, and in one instance the expert who examined them was a bad case of color blindness.

The authorities, legislative and otherwise, sought to serve the public by weeding out all men who could not match colored yarn, and they should no longer serve as engineers or pilots, and we were to have no more accidents on land or water from mistaken signals. But it soon occurred to railway managers that the weeding-out process was depriving them of the services of some of their safest men who had been with them for many years and never an accident, and in not a few instances new men who had certificates of perfect vision made fatal mistakes after serving less days than the veterans they displaced had been there years. It did not matter whether an engineer called a red light green, or *vice versa*, so long as he knew just exactly where it was and its meaning and acted accordingly, and it was an act of great injustice to discharge men who had safely taken trains through by night and day, past hundreds of colored lights and targets, for years.

If a finished education is regarded as necessary to make a first-class trainman, and legislative authority should demand the removal of all engineers and others who should fail to answer all the silly questions put to them by one of the modern, cranky examining boards, some

thousands of the best locomotive runners in America would have to "step down and out."

Education is desirable and a fine thing to have, but it is hardly advisable to ignore a good *practical training* and a good stock of common-sense when selecting men for responsible positions, and give precedence to men loaded with fine spun theories and nonsense.

Another matter which tends to reduce the efficiency of railway operatives is the excessive service required in the line of promotion. On some roads the term of service required for advancement is not only unreasonable but a direct insult to intelligent Americans who do not require a life-time to become expert in any line of service they may adopt as a profession.

In this country young men are supposed to be twenty-one years of age when they set out on the journey through life on their own account. Suppose a young man decides to win his bread by becoming a locomotive engineer and he wishes to reach the front rank of the profession. After serving three years in the machine shop, three years firing, three in the yard switching, and so on from one train to another through the regular order of promotion, he will be forty-two years old when he reaches the throttle he has been striving for for twenty-one years. Now, if this man had not mistaken his calling, and he was an average American, he has been held back on short pay for at least fifteen years and the company has been working a first-class man in a third, fourth or fifth-class position for the same period. If he was not a born engineer, the twenty-one years, or twice that, of drill and practice would not make him one. This is not American practice, although it has been introduced here to the manifest disadvantage of employers and employés. Promotion is so far off that there is but little inducement to seek it on the score of efficiency, as it is rather a matter of time than a "survival of the fittest." In selecting men for promotion their record of performances should be considered as well as their length of service. Of course, length of service should ordinarily take the preference, but there are numerous cases where men become expert with comparatively little drill or practice, and as it is for the interest of the railways as well as the public they serve to keep their most reliable men in the most responsible positions, they should be placed with reference to their "special fitness," regardless of what knowledge they may be loaded with on matters in no way connected with their duties, or the advantages they have had for superior training.

Some years ago, when European wars were making a great noise, our government selected a man who had been schooled in the art of war and sent him abroad to learn more. At the close of these wars he returned and was regarded as the greatest military man of the age. He certainly had the greatest advantages in that line of any man in America, and he was selected to crush our late rebellion. He proved a miserable failure, and was the very essence of incompetence; and the work that was expected of him was accomplished by men who had but a limited or no military training, and of whom the country had little to expect in the way of military genius. This is not brought forward as proof that there is no good in education or special training. but is mentioned as a single instance of thousands of a like nature where unfortunate selections have been made of men for responsible positions in all kinds of service, by placing too great reliance on what is usually termed thorough education. The finest railway officials in America are those who commenced at the bottom and reached the top after a practical experience in all departments of the service. Usually their advancement has been rapid, but their practical experience, together with a good stock of common-sense and habits of observation, has made them familiar with all working departments and they seldom make mistakes in their selection of skilled operatives. They select men for what they are worth; real merit being preferred to polish, tone and nonsense. In this matter let the fittest survive.

ARBITRATION INSTEAD OF STRIKES.

SENSIBLE WORDS BY THE LOCOMOTIVE ENGINEERS' JOURNAL.

THE *Locomotive Engineers' Journal*, of which Mr. P. M. Arthur, chief of the engineers' brotherhood, is one of the editors, has an extended and able editorial in its May number headed "Arbitration the true method to settle labor controversies," from which we take the following—taking issue only with the assumption that strikes are *ever* necessary:

"There are two recognized methods for the settlement of labor controversies, arbitrating and striking. We have no hesitancy in declaring that arbitration is the better method, the most rational and, all things considered, productive of incalculably the best results. In saying this, we must not be understood as condemning strikes as a last resort—when all other means for obtaining rights and for maintaining rights have been exhausted.

"In adducing such arguments and illustrations as we can command, to demonstrate that arbitration is a better method than the strike to settle labor controversies, and the true method to settle such controversies, we shall first present the financial, the dollar-and-cent aspect of the case, because labor controversies generally originate in the question of wages and earnings.

"It matters little what numbers are employed for the purpose of illustration. For convenience we will suppose 1,000 men receiving $1 a day become dissatisfied and demand $1.25 a day. We will suppose the demand is refused, and that a strike is ordered. We will suppose the strike thus inaugurated continues six months, or 150 working days, and that at the expiration of that time the demand is granted and work resumed.

"We are now in a position to make out a balance sheet showing of profit and loss.

"One thousand men working 150 days at $1.00 a day receive $150,000, and, since they did not work, being engaged in a strike, they lost $150,000, the amount they would have otherwise received.

"We will say, and the estimate is certainly low enough, that these 1,000 workingmen and their families required $1.00 a day to supply them with the necessities of life, since it does not matter whether at work or idle, the expenses of living are maintained. As a consequence, since the strikers did not earn a dollar a day while idle, but did expend a dollar a day during the strike. $150,000 was required. Here, then, we have the fact, that the strikers at

the expiration of the strike, 150 working days, are out of pocket $300,000. They lost what they did not earn, $150,000, and they expended from previous earnings $150,000 to live; or, if that amount had not been accumulated, it was obtained by borrowing or otherwise going in debt.

"We have stated that the strike was ordered because the employer would not pay the advance demanded, twenty-five cents a day. But at the expiration of six months, 150 working days, we will assume for the sake of illustration, that the demand of the men was granted, and that the work was resumed at $1.25 a day.

"We have shown that the men, on the day work was resumed, were out of pocket $300,000. The question now is, how long will it require them to make good this loss, at the advance of twenty-five cents a day. One thousand men at twenty-five cents a day receive $250.00 a day, and it will, therefore, require 1,200 days, just four years of 300 working days each, to recover the money sunk in the strike.

"But suppose instead of striking, arbitration had been chosen as a means of settling the controversy. In that case there would have been conferences between employer and employed, during which time work would have proceeded as usual. The employer would have frankly stated his reasons for not acquiescing when the demand was made for an advance, and the employés, in turn, would have urged their necessities; and finally, we will suppose an agreement was reached, and an advance of 15 cents a day conceded. How stands the account at the expiration of six months, or 150 working days, and at the expiration of four years from the time work was resumed.

"One thousand men working at $1.15 a day receive $172,500 for 150 days' work, and having saved what the strikers expended, find themselves better off than if they had struck, by the amount received, $172,500 and by what they had saved of previous earnings, that would have been expended during the strike, $150,000, a total of earnings and savings, of $322,500.

"We have supposed in case of the strike that after six months, or 150 working days, the workingmen received $1.25 a day, and we have shown that it would require just four years, at the advance of twenty-five cents a day, to make good their losses during the strike.

"Suppose the strike occurred on the 1st day of January, 1882, and continued till the 1st day of July, 1882, in that case work would have been resumed on the 1st day of July, 1882, and the four years required to make good the losses sustained would have extended from July 1st, 1882, to July 1st, 1886. During that period the 1,000 men at $1.25 a day would have earned $1,500,000.

"If arbitration had been the method of settlement adopted the account would have stood as follows: 1,000 men, working at $1.15 a day from January 1st, 1882, to July 1st, 1886, four and a half years, 300 working days to the year, would have received $1,552,500, or $52,500 in excess of the amount received by the men who settled their controversy by a strike.

"From a money point of view, arbitration is manifestly a better method than the strike for the adjustment of controversies between labor and capital, or employer and employé. But arbitration presupposes that employers will always be ready to listen to the grievances of employés, and will respond in the spirit of justice and fair play. And it also presupposes that employés have real grievances which ought to be investigated. If employers pursue a different policy, if there is hesitancy and postponement, or the exhibition of arrogance and superiority which ought not to be manifested, and which is fruitful of ill-omened opposition—strikes, however objectionable they may be, or however disastrous in their consequences, may be expected to disfigure the pages of our industrial history in the future as in the past, and even now.

"Arbitration must be based upon mutual confidence, upon the idea that both parties are earnestly seeking for a basis of settlement mutually beneficial. This done, results can be predicted with unerring certainty.

"We have written of arbitration as a better method than the strike for the settlement of labor controversies in its financial aspects only, but we do not pretend to have exhausted the subject; indeed, we have discussed only the profit and loss to the workingmen. Justice demands that the profit and loss of employers should be stated. To give this branch of the subject the prominence to which it is entitled, would extend this article beyond prudent limits. It may be, in this connection, sufficient to say, that capital and labor being interdependent, when one suffers, both are injured, and that when both are employed, prosperity becomes a universal benediction. Nor are employer and employé alone interested in sustaining amicable relations between capital and labor. There is a great public ever watchful and profoundly concerned in such questions, and this fact demonstrates the absolute correctness of the proposition with which we started out that the alliance between capital and labor is natural, necessary and inevitable.

"But there is another vastly important view to be taken of the subject, a view ouside of the domain of wages and dividends. We refer to the moral feature of the subject.

"In writing of arbitration we believe it to be potent in the development of the better qualities of human nature and of bringing them into active service, such as integrity, veracity, justice and those honorable ambitions promotive of individual and public welfare; while strikes, in the very nature of things, beginning in antagonisms, are liable to engender deep-seated animosities which all too often develop into overt acts of hostility, and which, dethroning judgment, enthrone anger, and giving passion full sway occasion deplorable excesses.

"We do not say there are not exceptions, but with current records in full view, we are warranted in saying that the tendency of strikes is in the direction of conditions at war with the welfare of those who engage in them and that they are prejudicial to the welfare of society.

"The legitimate deduction from such premises is, therefore, that arbitration is the true method to settle labor controversies; the true method financially, and the true method morally, because it brings into operation the better qualities of human nature.

"Arbitration appeals directly to men's judgment, to what may be termed rectitude in human affairs, without which the idea of settlement of controversies upon a righteous and permanent basis, must forever be visionary and vain."

HYDRAULIC LIFTS ON THE MERSEY RAILWAY.

BY WILLIAM EDMUND RICH.

[A Paper read before the Institute of Civil Engineers, May 4th.]

A NOVEL feature of the Mersey Railway was the introduction of large hydraulic lifts for conveying passengers and their luggage from the deep underground stations at James street and Hamilton street to the daylight stations at the street level above. At each station there were three lifts, which were worked quite independently of one another, and were each capable of raising 100 passengers at a time. The average journey was accomplished in from 30 to 40 seconds, and the three lifts working simultaneously were capable of raising a heavy train load of 300 passengers to the surface in about a minute.

The lifts at James street had a stroke of 76.6 feet, and those at Hamilton street a stroke of 87.7 feet, and there was 50 per cent. more engine-power at the former station; but in other respects a description of the arrangements at James street would suffice.

Each lift was of the direct acting ram type, and was contained in a rectangular shaft 21 feet long, 19 feet wide, partly excavated out of the solid red sandstone rock, which stood well without lining, and partly inclosed in walls of brick in cement. This shaft descended to 8 feet below the lower hall floor, and a central boring 40 inches in internal diameter was carried down 75 feet further.

The cylinders which inclosed the ram were suspended in this boring from a large bell flange on the top length. They were 21 inches in internal diameter and were fitted with a hat-shaped leather at the top end for making the joint round the ram.

The ram was 18 inches in diameter and ½ an inch thick, and was constructed of mild steel lap-welded tubes in lengths of about 11 feet 6 inches, connected together with internal screwed ferrules 6 inches long and 15¾ inches in internal diameter. For extra security wrought iron rods 1½ inches in diameter were carried up the center of the ram, which at its top end entered the boss of a large forged steel cross, and was secured to it by the above rods and turned bolts. The cross was 11 feet long and 9 feet 6 inches wide, and was forged by Messrs. Clay, Inman & Co., from a single steel ingot. The ends of the arms were riveted to girders, which were laid transversely beneath the lift cage, and extended beyond its sides to enable the the counterweight chains to be attached at their outer ends. The ascending room or cage, was a handsomely paneled wooden structure 19 feet 6 inches long, and 16 feet 6 inches wide, and 8 feet to 10 feet high, measured on the inside, with seats for 24 passengers at the sides, and a large gas-lamp in the center of the roof. It was founded on pitch pine floor joists 10½ inches deep, which were strapped down to the iron girders above mentioned with iron stirrups. It was guided by four cast iron V-guide brackets bolted to the ends of the cage girders, and bearing against four steel guide-rails of a special section, which were fixed to the side walls of the lift space. Four similar rails guided the counterweights, which were suspended by 1⅛ inch chains; these passed over pulleys at the top of the lift space, and at their other ends were attached to the extremities of the cage girders. Two chains 7 inches apart were attached to each weight, and thus relieved the ram of transverse strain, if the load was concentrated near the front or the back of the cage. The lift starting valve was a gun-metal slide, working over V-shaped ports, and was actuated by hemp hand-ropes with wire cores, which passed through the cage on either side of the doorway, with stops on one rope for automatically closing the valve when the cage reached the top or the bottom floor. The lifts were worked by water at a low pressure from a 10,000 gallon circular wrought-iron tank, contained in a tower with its bottom at about 111 feet above the street level. The water was discharged during the down stroke into a waste tank of similar capacity with its bottom at 10 feet above the lower hall floor. The net effective fall was thus 176.5 feet, or 76.4 pounds per square inch. The engine-room floor was 27 feet above the lower hall, and contained three steel marine boilers and three pairs of high-pressure duplex pumping-engines, each capable of raising 500 gallons per minute.

Track Laid from January 1 to May 1.

FOUR months of the year 1886 have now gone and the season of railway construction is fairly open. Previous to May 1 comparatively little construction takes place, the long winters in the north and the early floods in the warmer latitudes presenting natural obstacles to the work of grading, bridging and track-laying, and the early part of the year also being chiefly required for maturing financial plans and collecting the material and forces for the forward work of the later seasons. In 1885 railway construction reached the lowest figure shown in this country for seven consecutive years, the total addition to our mileage being in round numbers only 3,200 miles. The present year opened somewhat under the depressing influences of the previous year, and although it has already been signalized by the projecting of numerous plans for railway extension, covering many thousands of miles, there has not yet been time for the active campaign to fairly begin and of course not much track-laying could be expected up to the present. Nevertheless we find from returns received at this office that a very considerable extent of mileage has already been laid down, as the following table will show:

TRACK LAID DURING THE FIRST FOUR MONTHS OF 1886.

State.	No. Lines.	Miles.
Alabama	1	2.0
California	4	43.2
Florida	3	83.5
Georgia	3	15.0
Indian Territory	1	10.5
Illinois	2	88.0
Indiana	1	30.0
Kansas	4	54.5
Kentucky	1	24.0
Louisiana	1	9.0
Michigan	1	1.0
Minnesota	1	3.0
Mississippi	1	4.0
Missouri	1	14.0
North Carolina	1	2.0
Ohio	1	5.0
Pennsylvania	2	16.0
South Carolina	1	8.0
Texas	4	122.1
Washington Territory	3	37.7
West Virginia	1	4.0
Wisconsin	2	90.0
Total in 22 States	40	666.5

It thus appears that we have a record of track-laying in the present year in 22 of the States and Territories on 40

lines, which has already reached an aggregate of 666½ miles of main track, not counting the very considerable mileage of sidings and of old track relaid. This total is about twice that reported up to the same period last year, although the winter of 1884-5 was much more severe than the one just passed, which would account in part for the small amount of construction last spring up to the same date; but the total given for the past four months is also larger than that for the same period in 1884, and indeed in any of the last thirteen years, excepting the four years, 1880, '81, '82 and '83, the aggregate of construction for 1882 exceeding that of any previous year in the history of the country. It will be seen from the table that some track-laying has already been done in nearly half the States of the Union, although most of them report only one road each. The principal activity thus far appears to be in Texas, Wisconsin, Illinois, Florida and Kansas, and these figures are an indication of the very large mileage which is actually under construction in these States, as the record for the full year will show. Of the 40 lines referred to in the table, track-laying is still in progress on at least 24, and these alone expect to add fully 1,800 miles to their present mileage during this year.

The important characteristic of the construction work for the present year is the fact that it will be largely done by a few great competing companies, who have set out to parallel or head off each others' extensions in the most rapidly growing and central portion of the Union. While also a large number of independent projects are on foot, many of which will take tangible shape if the labor troubles do not stop the wheels of enterprise, still the greater part of the new mileage for 1886 will be due to the progressive movements of the already great companies. Although it is too early to indulge in any definite predictions, there have already been laid out, and to a considerable extent entered upon, a sufficient number of new lines to make it reasonably certain that the aggregate of track laid in 1886 will be very considerably greater than in 1885, and probably greater than that in 1884 also. As the year 1882, when the enormous amount of 11,568 miles of track were laid in the United States, marked the culmination of a period of extraordinary activity in railway building, so the year 1885 doubtless marked the end of a three years' period of rapid decline in construction, and we now seem to have entered again upon the up grade, in this respect.

Certainly the prospect for manufacturers of railway material and supplies, and for contractors and workmen in railway construction is very encouraging, provided always that irresponsible and idiotic labor agitators do not forcibly interfere to prevent the natural tendency toward activity and general prosperity.—*Railway Age.*

Railway Earnings in April.

A LATE issue of the *Railway World* says: "A table of the reports of sixty-eight companies shows that their gross earnings in April represent a net increase of $252,902. This result is unexpectedly favorable, in view of the depressing influences that prevailed during the month, and the serious losses suffered by a number of the lines. The aggregate receipts were $17,885,481 in April, 1886, against $17,632,579 in April, 1885. Losses are reported by twenty-three lines, or subdivisions of lines, and the list does not embrace the roads most seriously affected by the northwestern strike, such as the Missouri Pacific and Texas and Pacific. The most serious diminutions of earnings are those reported by important northwestern and southern lines. On leading northwestern lines the following declines occurred: Chicago, Milwaukee and St. Paul, $163,264; Chicago and Northwestern, $29,229; St. Paul, Minneapolis and Manitoba, $100,708. The losses reported by lines traversing Southern States include the following: Southern Division of the Illinois Central, $61,771; Louisville and Nashville, $192,009. The losses on the northwestern roads were probably caused chiefly by a diminution in the magnitude of the grain movement, and the losses on the southern roads named are partly due to differences arising from the beneficial effect of the New Orleans Exposition on the earnings of last year, partly to increased competition, and partly to other causes. Some of the incidental effects of the strike are presumably indicated in a decrease of $20,602 in the earnings of the St. Louis and San Francisco, and a decrease of $31,323 in the earnings of the main line and branches of the St. Louis, Alton and Terre Haute.

"The list of gains includes $110,257 by the Northern Pacific, which is partly due to an increase of 288 miles in the length of the lines operated, and partly to the fact that influences affecting much of its traffic were different from those which reduced the earnings of the northwestern roads that suffered losses. Southern lines near the Atlantic seaboard were more fortunate than those located near the Mississippi. The Richmond and Danville reports an increase of $39,703 on its main line, and small gains on each of its subdivisions.

"The most noticeable and significant gains were those reported by roads whose revenues have been presumably increased by the persistent efforts of the trunk lines and their western connections to check and prevent ruinous competition. It is chiefly on this account that the Grand Trunk, of Canada, reports an increase of $73,517, and the Wabash a gain of $160,462, and that nearly every direct western connection of trunk lines increased its earnings during April, notwithstanding the depressing effect of the strikes."

Duty of Companies to Passengers at Stations.

IN the case of Thompson against the Central Railroad and Banking Company, the Georgia Supreme Court holds as follows:

1. It is the duty of a railroad company so to fix its station or depot that a passenger who gets off at a depot or place to alight may get off the car without danger; and it is also its duty to fix such a way of exit from the depot over its right-of-way that the passenger may go away from the place at which the passenger is invited to get on and off without danger to life or limb; but it is not its duty to see him safe and secure in his exit from the track and over its right-of-way. The carrier is not bound to insure him a safe exit from the depot, but to insure only a safe way for him to use for an exit.

2. The charge on this subject was hardly apposite to the case, where the injury did not occur at a depot, but a point several hundred yards from the depot, where he

was induced by the agents of the company to leave the train, or else voluntarily left it, without inducement from them. There is a difference between the ordinary announcement of a station as the train approaches it, so that the passengers may prepare to leave the train when it reaches the station, and the announcement after the train has stopped; in the latter case it is equivalent to inviting the passengers for that station to leave the train. If the passenger in this case got out without such an announcement, it was his act; if he was deceived by the announcement, it was the company's act, so far as fault is concerned.

3. The railroad company contracted to give the passenger in this case a safe transportation to the station of his destination, and until it carried him to that regular and safe landing, it was responsible for slight neglect, extraordinary diligence being the measure of its care for him to that place. But though the company may have been negligent, it could defend itself and defeat a recovery of damages by showing that when the passenger was endangered by its negligence, he could have avoided the consequences of it by the use of ordinary care.

4. In defense to a suit by a widow against a railway company for the homicide of her husband, a recovery may be defeated if the husband's own negligence either caused the injury, or if he could have avoided the consequences of the defendant's negligence by the use of ordinary care.

American Competition in Australia.

THE somewhat important announcement is made that a contract has been signed between the Government of New South Wales and the Union Bridge Company of New York, for the construction by the latter of a bridge 3,000 feet in length across the Hawkesbury, one of the most important rivers of the colony. The structure which is about to be commenced is a double-track railway bridge, consisting of seven spans of 415 feet each, resting upon stone piers. The foundations, which are to be of beton, inclosed in iron caissons, are to be carried 170 feet below tidewater, and the work is to be completed in two years and a half for £300,000—a sum very much below the original estimates framed by the colonial government engineer. The contract was obtained in competition with English contractors, and is stated to have been awarded to the Union Bridge Company of New York on the decision of certain colonial engineers that the foundations proposed were the best among sixteen plans submitted for consideration. This piece of intelligence will naturally be read with considerable interest by English industrials, as it shows beyond all doubt, first, that American firms have their attention keenly directed to works on hand in the Australasian colonies; and, second, that the proprietors of English works will have to make up their minds to execute contracts based upon the lowest possible rates. We are not, however, disposed to at all despair of the retention of, at any rate, a large share of the Australasian markets by English industrials, provided they can show more adaptability to the conditions of colonial life. American firms have probably one advantage over English competitors, namely, that the United States call for comparatively new and impromptu devices to deal with natural obstacles. The effect of this is to stimulate the inventive power of the Americans, and, to put the matter in homely language, they are probably somewhat readier witted than Englishmen, who are more prone to move in some old-established groove. This is true not only of bridge building but also of the building of locomotives. The Americans long since devised locomotives which were more adapted not only to the roughly constructed railways of their own country, but also to new lines at the Antipodes. By the introduction of the bogic truck American locomotive builders have succeeded in turning out engines capable of rounding curves and running on road-beds which would have altogether frightened English firms. So with bridge building; American engineers have made it quite a specialty; the formidable rivers with which they have to deal in their country have taxed their inventive powers to the utmost, and they are accordingly very much at home when they are called upon to devise bridges for railways at the Antipodes.—*London Colliery Guardian.*

Increase in Trade Journalism.

ACCORDING to a late issue of the *Clothier and Furnisher*, of the 722 newspapers and periodicals published at New York City, a little over one-sixth, or 122, strictly come under the head of news and general information. The journals of a special character, but also furnishing general news, and the papers and periodicals dealing with special matters of universal interest, augment the 122 newspapers mentioned to 413. The remaining 309 are purely class papers and trade journals.

In 1860, as regards to number, the five leading classes of newspapers and periodicals in New York and the five minor classes were as follows:

General news	81
Religious	57
Literary	25
Commercial	11
Medical	8
Science	7
Trade	5
Railroads	3
Education	2
Mechanics	1

The classification at the present time is as under:

Trade	127
General news	122
Religious	89
Literary	56
Medical	37
Commercial	27
Science	25
Mechanics	20
Education	15
Railroads	14

The above comparison is particularly valuable as showing the enormous increase of trade journals in the quarter of a century. They now outnumber all other classes.

The Proposed English Railway Legislation.

ACCORDING to a recent issue of the *Railway World* the character of some of the changes contemplated by the bill recently introduced in the House of Commons, with the sanction of the existing government, has excited much alarm among English railway managers. They claim that it seriously endangers the security of railway property, and violates or repeals provisions which led shareholders to invest their money in railway enterprises. Several important companies have addressed circulars to their stock-

holders, inviting them to attend meetings which are to be held for the purpose of considering the best methods for defeating the new bill. In one of these circulars it is denounced as "absolutely confiscatory in its character," and its tendency and probable effect is declared to be to "deprive all owners of railway stocks of every security for their capital and income." In another circular special attention is directed to the following provisions of the bill, which are declared to be objectionable in principle, viz.: "1. The revision of maximum rates and charges compulsorily, instead of by agreement. 2. The giving of powers to the Board of Trade to intervene between traders and railway companies, when the rates are neither illegal nor unfair. 3. The prohibition of any appeal upon the question of undue preference. 4. The unlimited power to the Board of Trade to require statistical returns from railway companies."

The new measure is regarded as one of the most radical that has ever been seriously proposed in England, and it approximates, in some of its requirements, to the granger laws of this country. A meeting of the shareholders of the Metropolitan declared that it "practically transfers the management of railways from responsible managers to a government department which is not responsible to the public for accident or errors in management or administration."

The result of the approaching struggle will be awaited with interest. The English lines may be more deeply affected by adverse legislation than the American railways which have heretofore been obliged to cope with unjust legal requirements, inasmuch as many of the British rates are fully up to the standards authorized by charters, while here the opposite rule prevails very extensively.

The London *Railway Times*, in commenting upon the bill, says that "the custom seems to have gained ground of late of regarding the railways, not as commercial concerns, as they really are, struggling for a return upon the capital invested, but as national institutions existing merely for the benefit of the public; and it is this which renders it almost impossible to arbitrate between two interests so diametrically opposed." The fact that railways are commercial concerns, "struggling for a return upon the capital invested," is so generally ignored by the agitators of anti-railway measures in this country, that it is refreshing to notice a repetition of this fundamental truth. Horatio Seymour indirectly reiterated it, in a discussion of transportation questions published a short time before his death, when he said, in substance, that the efforts of railway managers to secure a reasonable return for the capital invested in railway property were commendable. But this vital consideration is usually treated with contemptuous indifference by the average advocate of important changes in existing railway legislation.

Car-Couplers in Michigan.

THE Michigan Railroad Commissioners have selected seven automatic or safety car-couplers for use in that State. As the law now stands, therefore, no railroad in that State can fix any other coupler to their freight-cars. It is therefore a matter of some surprise that the list of couplers selected excludes several that are in extensive use in various parts of the country, and some that have been approved of in another State. The couplers selected by three different bodies, the Master Car-Builders' Association, and the Railroad Commissioners of Massachusetts and Michigan respectively, include collectively no less than 17 different devices. If New York and other States follow the example thus set by Massachusetts and Michigan, the number of couplers approved of in one State and not considered worthy of use in another will be largely increased. The following table shows the present state of the question:

APPROVED AUTOMATIC CAR-COUPLERS.

Master Car-Builders' Association, Sept., 1885.	Massachusetts Railroad Commissioners, Jan., 1885.	Michigan Railroad Commissioners, May, 1886.
.....	.....	Aikman.
Ames.	Ames.	Ames.
Archer.	.....	.....
.....	.....	Blocker.
Cowell.	Cowell.	Cowell.
Dowling.	.....	.....
Gifford.	.....	.....
Hein.	.....	.....
.....	Hilliard.	.....
Janney.	Janney.	.....
Marks.	.....	Marks.
.....	.....	McCree.
McKeen.	.....	.....
Perry.	.....	Perry.
Thurmond.	.....	.....
Titus & Bossinger.	.....	.....
.....	United States.	.....

It thus appears that no fewer than 17 different couplers have been approved of by three independent bodies of men, acting in a quasi-judicial capacity and not as the officers or advisers of a money-earning corporation. An eighteenth coupler, the Smillie, has received a practical indorsement from a railroad in the shape of a large order from the Delaware, Lackawanna and Western. We may, therefore, say that some twenty different car-couplers have already received the more or less emphatic approval of bodies of men who have had some opportunities of testing the merits of the rival inventions. This gradual widening of the list certainly does not seem to promise an early solution of the car-coupler question in the direction of the general adoption of practically interchangeable couplers.

It will be observed that the Michigan list includes three couplers, Aikman, Blocker and McCree, which were not mentioned by the Master Car-Builders' Association or the Massachusetts Railroad Commissioners. These couplers may possibly possess sufficient merit to render them worthy of a more extended practical trial, but it is difficult to see on what grounds the Michigan commissioners have shut out several undoubtedly good couplers which were approved of by the most competent practical judges, the Master Car-Builders' Association. The master car-builders had not only the results of the trials at Buffalo to guide their decision, but also had access to the confidential information acquired by the use of the majority of the couplers in practical service on their own lines. Possibly, however, the Michigan commissioners are willing to try further experiments and include in their lists some of the couplers which the Master Car-Builders' Association and several large railroads consider possess great practical merit.

The course things are taking, however, shows how unfit any State tribunal, even if technically qualified, is to give decisions on such a matter, simply because it is a question of national and not of State interest. There is nothing

to prevent the New York Commission from excluding from the couplers to be used in their State *all* the couplers approved for application in Massachusetts and Michigan, and then cars built for New York companies would be excluded from both those States.—*Railroad Gazette.*

Record of New Railroad Construction.

INFORMATION of the laying of track on new railroad lines is given as follows:

Pennsylvania.—A branch is completed from near Altoona, Pa., to the Tipton Run coal mines, 4½ miles.

St. Johns and Halifax.—Track laid from Ballstown, Fla., southeast to the Tomoka river, 40 miles.

Southern Pacific.—The Northern Division is extended from Soledad, Cal., south 2½ miles.

This is a total of 47 miles on 3 lines, making in all 853 miles thus far reported for the current year. The new track reported to the corresponding date for 15 years has been:

	Miles.
1886	853
1885	546
1884	913
1883	1,593
1882	3,203
1881	1,480
1880	1,519
1879	619
1878	407
1877	461
1876	542
1875	260
1874	436
1873	918
1872	1,557

These figures include *main track only*, second or other additional tracks and sidings not being counted.

Watching a Railway Collision.

AN eye witness of the Monte Carlo accident sends to the Paris *Temps* the following description of it:

"The catastrophe which has just taken place on the Monaco frontier has a peculiarly dramatic character. It occurred under the eyes of five or six hundred persons, helpless to prevent it, and this is one of the most thrilling features of the event.

"At five o'clock precisely the train, No. 483, was at Monte Carlo station, being five minutes late. Hundreds of passengers alighted. A still larger number of people were preparing to start for Nice by the train expected from Mentone. There was unusual bustle on the platform. At this moment I saw the station-master, of whom several persons were asking information. He seemed flurried. 'Enter my office,' he said to two of them; 'I will attend to you presently.' He then, as it seemed to me, ran to see after the luggage. Suddenly the train moved on. I can still see the guard jumping down from the luggage wagon. The station-master had at this moment an instinct of the disaster about to happen. 'Who signaled train 483?' he asked, in a voice broken by emotion. 'Not I,' replied the head porter. 'Was it you, then?' said he to a second official. 'No, sir.' At this answer the unfortunate man put his hands to his head and became quite livid.

"It did not take more than a second for the crowd to comprehend the danger which the train was incurring. Moreover, the coast between Cape St. Martin and Monte Carlo is so curved that the whole line was under the spectators' eyes. Three trains could be seen, with their puffs of white smoke. The first was about to enter the St. Martin tunnel, and ran no danger; the second had just left Roquebrune, and was advancing at full speed against the one going away from us. No idea can be formed of the anguish of the three hundred or four hundred spectators of this scene. At first everybody hoped that the collision would not take place. The coast was all open. 'They will see each other in time,' said people on all sides. The station-master ordered all the bells to be rung, in order to make as much noise as possible. Four hundred men rent the air with their cries. The two columns of smoke, however, continued to get closer and closer. Those in the two trains did not see each other. Everybody screamed and gesticulated. Such impotence, in presence of such a danger, was enough to drive one mad. At last the driver of the train coming from Mentone saw the danger, and reversed his engine. But the other, in consequence of the curve, noticed nothing, and continued to advance. They were within 200 metres of each other—100 metres—10 metres. A great shudder ran through the crowd. The women turned away their heads, not to see what happened. A sharp cry was heard as a girl went into hysterics.

"The collision took place. The two trains were seen tilted up one against the other, and then there was a horrible incident; two or three carriages, falling over the parapet, were precipitated on to the rocks on the coast. A thick smoke spread all around. Driven to despair, the station-master no longer knew what he was doing. There were cries on all sides of 'the doctors! the doctors!' Every one rushed forward. Twenty-five or thirty persons went up the line, and reached the spot where the accident had happened. It is impossible to describe the scene. No one can form an idea of it but those who saw it.

"The two carriages which had fallen from a height of thirty metres on to the rocks and shingle seemed to have been reduced to dust. Luckily there were only three persons in them. One was killed on the spot. By a miracle, the two others were only injured. They are seriously injured, no doubt, but their recovery is not despaired of. The two engines had become, so to speak, welded into each other. Behind and above them four carriages of the Mentone train were piled on each other, twisted out of shape. A young man at great risk to himself succeeded in turning off the valves, which were throwing out a blinding steam, and then the injured persons were found. I saw seventeen, more or less seriously hurt, taken away.

"Close to where I stood I saw an arm, on which the person next to me was on the point of treading. An attempt was made to extricate the unfortunate man to whom it belonged. But the bars of iron, beams, broken wood, doors, roofs, bolts, and broken glass were so bound together as to render the task almost impossible.

"To understand the violence of the shock, it is necessary to imagine two engines and four carriages occupying, as regards length and length, the place of one ordinary engine. A second-class carriage had been turned completely upside down, and had lost its wheels.

"The authorities from Nice and Mentone arrived at the scene of the accident during the night, and the work of clearing away the rubbish was begun by torch-light."

English Rail Importations.

ACCORDING to the *Railroad Gazette* the recent purchases of English rails by the Michigan Central and the Chicago, Burlington and Quincy railroads are probably the cause why the Board of Trade report shows the British export of rails to the United States to have been larger last April than in any other April since 1882, and larger than in the whole year 1885. They cannot be called large, however, having been 6,836 tons, which is not more than two days' consumption. Nevertheless, they were more than the British exports in that month to any other country except India, and more than one-fifth of the total exports, the exports to other countries being exceptionally small, and one-third less than last year. For the four months ending with April, the British exports have been:

Year.	To U. S.	To other countries.	To all countries.
1879	1,184	90,982	92,166
1880	62,391	109,451	171,842
1881	86,292	92,079	178,371
1882	88,921	159,788	248,709
1883	19,222	238,401	257,623
1884	8,647	166,857	175,504
1885	3,001	146,495	149,496
1886	8,672	106,908	115,580

Thus the total British rail exports for the four months ending with April have been smaller this year than in any other since 1879. The activity in railroad construction, which began here in the last half of 1879, did not appear in the countries which England supplies with rails until 1882; but while we reached our maximum construction in 1882, those countries did not reach their maximum until 1883, and for three more years took more rails than in any year before 1882. These countries other than the United States, several of which are supplied exclusively from England, including the British colonies, which, next to this country, are the greatest railroad builders, have this year taken 27 per cent. less rails than last year, 36 per cent. less than in 1884, and 55 per cent. less than in 1883. We must conclude, therefore, that this is a period of exceptionally little railroad construction outside of Europe and the United States, which supply themselves chiefly with rails, not depending upon English mills.

An Early Electric Motor.

PROFESSOR PAGE made a trial trip with his electromagnetic locomotive on Tuesday, April 29, 1851, starting from Washington. The progress of the locomotive was at first so slow that a boy was enabled to keep pace with it for several hundred feet. But the speed was soon increased, and Bladensburg, a distance of, I believe, about five miles and a quarter, was reached in thirty-nine minutes. When within two miles of that place, the power of the battery being fully up, the locomotive began to run, on nearly a level plane, at the rate of nineteen miles an hour, or seven miles faster than the greatest speed heretofore attained. This velocity was continued for a mile, when one of the cells cracked entirely open, which caused the acids to intermix, and as a consequence, the propelling power was partially weakened. Two of the other cells subsequently met with a similar disaster. The professor proceeded cautiously, fearing obstructions on the way, such as the coming of cars in the opposite direction, and cattle on the road. Seven halts were made, occupying in all forty minutes. But, notwithstanding these hindrances and delays, the trip to and from Bladensburg was accomplished in one minute less than two hours. The cells were made of light earthenware, for the purpose of experiment merely, without reference to durability. This part of the apparatus could therefore easily be guarded against mishap. The great point established was, that a locomotive on the principle of Professor Page, could be made to travel nineteen miles an hour. But it was found on subsequent trials that the least jolt, such as that caused by the end of a rail a little above the level, threw the batteries out of working order, and the result was a halt. This defect could not be overcome, and Professor Page reluctantly abandoned his discovery.—BEN. PERLEY POORE.

One Month's Accidents.

THE railway accidents for March show 22 collisions, 55 derailments and four other accidents, or 81 in all, in which 49 persons were killed and 131 injured. Two collisions, 15 derailments and one other accident caused the death of one or more persons each; 8 collisions and 13 derailments caused injury to persons, but not death. In all, 18 accidents caused death and 21 injuries, leaving 42, or 52 per cent. of the whole number, in which there was no injury serious enough for record. The yearly average for the four years was 1,340 accidents, 392 killed and 1,700 hurt. The monthly average for last year was 87 accidents, 28 killed and 115 injured. The average per day for the month were 2.61 accidents, 1.58 killed and 4 23 hurt; for the year there were, 2.86 accidents, 0.91 killed and 3.79 injured. The average casualties per accident were, for the month 0.605 killed and 1.617 injured; for the year, 0.318 killed and 1.326 injured. March was thus below the average of the year in accidents, but above it in the number killed and injured.—*Railway Reporter.*

By Rail to Constantinople.

THE lack of direct railway communication with Constantinople is every day felt as an increasing grievance, not only in the North Balkan States, but in central and western Europe generally. Amongst other regretable consequences of the late revolution in Eastern Roumelia and the Servo-Bulgarian war is the fact that, through those events, the Bulgarian authorities have been prevented from proceeding to the construction of the short line in Bulgarian territory which is all that is now wanting to complete the entire through-railway system connecting the Turkish capital with all parts of Europe. At length, taking advantage of the present respite from the pressure of external difficulties, Prince Alexander's government is devoting its earnest attention to this most urgent question with a view to discharge the engagements it entered into at the *Conference à Quatre*. Unfortunately, the Bulgarian company which had undertaken to build the Bulgarian section of this important international line has been compelled to go into liquidation. The contractor is seeking to form a fresh company to carry out the work, but it appears doubtful whether Bulgaria will not ultimately be compelled to have recourse to foreign capital to enable her to fulfill her engagements in this matter. —*London Standard.*

American Railroad Journal.

A MONTHLY MAGAZINE AND REVIEW.

(ESTABLISHED IN 1831.)

PUBLISHED AT No. 323 PEARL STREET, NEW YORK.

J. Bruen Miller, ... Editor.

Entered at the Post Office at New York City as Second-Class Mail Matter.

SUBSCRIPTION RATES.

Subscription, per annum, Postage prepaid.....$3 00
Single copies..... 25

Remittances should be made by Express Money-Order, Draft, P. O. Money-Order or Registered Letter.

MR. D. K. ELMENDORF is the accredited traveling representative of the JOURNAL, and is authorized to receive subscriptions and advertisements.

MR. J. HOWARD BARNARD, 7 Montgomery avenue, San Francisco, Cal., is the authorized Western Agent for the JOURNAL.

MR. FREDERIC ALGAR, Nos. 11 and 12 Clements Lane, Lombard Street, London, E. C., England, is the authorized European Agent for the JOURNAL

NEW YORK, JUNE, 1886.

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A SINGULAR SHOWING.

THERE would appear to exist a most amazing degree of confidence and trusting innocence in the rank and file of the various labor organizations, now and lately rampant, if we may judge by some specimen published reports.

In all other forms of business where large sums of money are handled, especially by paid agents, a rigid scrutiny is applied to the methods of the managers and financial disbursers, and every man, in however slight degree responsible, is held to strict account for every dollar passing through his hands. This does not necessarily imply a doubt as to the honesty of the various handlers of the cash, but is an eminently proper and necessary accompaniment to good and successful management of general and particular funds, no matter what their purpose or intent. No insurance company, bank or railway would for a moment dream of leaving their funds at the mercy of a set of men, even though their reputations for strict integrity and uprightness were considered beyond the faintest breath of suspicion: for let them be ever so honest and above doubt, a system which calls for no strict accounting and the presentation of full vouchers, can bring about but one result. Misappropriation more or less ruinous will as surely follow as the rising and the setting of the sun.

So well known and generally acknowledged is this truth that to learn and consider the methods—or rather lack thereof—in the financial department of railway and other labor organizations affords an insight into their workings and so-called management that leaves no longer room for surprise that so vast and apparently wealthy organizations as the Knights of Labor and the Unions should have accomplished so little.

Shortly after the inception of the Missouri Pacific strikes all readers of the newspapers were amazed to see the large sums of money raised for the strikers' relief, with apparently the utmost ease, and as frequently as called for or needed. In view of this impressive fact it was generally considered that the strikers were in a position where their own necessities at least could not come into play as a factor in the contest, as it seemed evident that, so well supplied with means, they were capable of holding out for practically any length of time, and poverty could not force them to submission or a compromise. In spite of this appearance of strength it was not long before there was a very evident desire to back down, frankly owning lack of means to live to be the cause; and now the strike is dead, and for some months the army of former workmen, with some very few lucky exceptions, have been and still are in dire straits through poverty.

The comic weekly, *Puck*, of June 16th, published certain

figures taken from the fiscal report of Typographical Union No. 6, a portion of which we use as an explanation of this singular state of affairs. This account is in two principal divisions, viz.: "Strike Relief Account" and "Committee Service and Strike Account." The total of the former for the years 1883 and 1884 amounted to the sum of $9,121.68, and the latter for the same period to the sum of $6,390.20. It should be specially noted that the former represents *a complete statement of relief paid* during the above-mentioned period, and shows $9,121.68 to have been the total sum distributed among hundreds of needy and, no doubt, many starving strikers with families to support, while $6,390.20 is the sum paid to a very few men whose main business was or should have been the simple distribution of the entire $15,511.88 to the strikers, excepting, of course, such unavoidable but comparatively trifling expenses necessarily involved. The vast preponderance of the sum should certainly have reached the strikers in the form of relief, since it was subscribed for that purpose; in place of which it will be seen that over forty per cent. of the entire sum to be distributed went in expenses. Truly a gratifying showing for the unfortunate strikers.

Let us glance at a few further figures taken from the "Committee Service and Strike Account." The following is an instance of the amounts paid to a single committee-man for his services on the various dates set down:

January 20,	(*Committee service*),	$6 00
October 25,	(on acct. of strike),	6 00
" 26,	" "	25 00
" 27,	" "	7 00
" 29,	" "	5 00
" 30,	" "	5 00
Nov'ber 1,	" "	12 00
" 2,	" "	13 00
" 3,	" "	21 00
" 12,	" "	18 00
" 17,	" "	18 00
" 20,	" "	16 00
" 22,	" "	12 00
" 22,	" "	25 00
" 27,	" "	5 00
" 28,	" "	5 00
Dece'ber 3.	" "	5 00
" 4,	" "	5 00
" 12,	" "	5 00
" 13,	" "	5 00
" 15,	" "	18 00
		$238 00

It will be seen by this interesting showing that leaving out the $6.00 item of January 20th there was paid to this single committee-man during the last three months of the strike the sum of $232.00, or at the rate of $928.00 per year, while taking the amount of relief paid out to three example strikers for the same period we find that they received, respectively, $7.00, $12.00 and $24.00, or an average of $14.33 each, which would give each striker the annual income of $57.32, as against the committee-man's $928.00.

In view of these facts taken from the organizations' own records, it is no longer a matter for wonder that labor societies generally lack organization and power to carry out their purposes, in spite of their apparent financial strength. With such a showing the marvel is more that they exist at all; but the reflection is irresistibly forced upon the mind that with proper and business-like methods of management applied to their undoubtedly great resources, and amalgamated into an honest, harmonious and well-directed unity, they would prove a power little short of invincible; and the enemy should indeed be strong to hope successfully to cope with them.

THE BOYCOTT.

A MORE dismal failure than the effort to introduce a successful boycott scheme in this country could scarcely be conceived. Within the past eight months in every instance the ringleaders of the various schemes set on foot have come to sad and sudden grief.

Take the present cases, for instance; every man on trial for conspiracy (boycotting) in our courts has been promptly adjudged guilty, with a most exhilarating unanimity, which gives fair promise for the future.

It matters little whether the above cases relate to Mr. THEISS, the beer-garden keeper, or a main line of railway. The principle involved in each is precisely the same, while the infraction of law in both cases is equal. The instance of Mr. THEISS has had its perfect parallel in more than one railway strike of the same nature; and it affords by no means a small meed of gratification that the Empire State, as represented by the New York Courts, should take the only just and proper stand, viz.: that the *boycott* is a crime.

It must be evident to any unprejudiced onlooker that this is a fact. The common law of all civilized nations declares that conspiracy is a felony, and it is plain that the boycott, as lately practiced in New York and other cities, is in its title a mere paraphrase for the first-mentioned crime. Its result is to spread debt and ruin on those who venture to disobey its behests, and, as instances in the last six months show, turn an honest and industrious woman, who works zealously for her daily bread, into a practical pauper.

And why? Simply because he, she, or it differed in opinion from the autocratic view taken by the boycott society on apparently all business questions. The great and controlling rule of supply and demand is not allowed to act by this noble band of revolutionists. On the contrary, they state boldly and distinctly that they are the sole and only arbitrators who are entitled in any way to judge between capital and labor, and, further, that their judgment stands without appeal.

The late results of these lawless efforts towards coercion in New York are, however, most gratifying. So far every man charged with the novel crime of *boycotting* has been convicted, and there is little doubt that all of his companions will follow him; and, better still, that the entire party will have an admirable opportunity to reflect on and renounce their errors within the cool and calming walls of Sing Sing.

It is high time that these general disturbers of public peace should learn a lesson, and it would seem at last that they who have in charge the proper administration of our laws will teach it to them.

EDITORIAL NOTES.

JACOB SHARP, the man of champion energy, would seem to have applied that most valuable business quality where it will do the least good. Mr. SHARP has spared no efforts honorable—or doubtful—to attain his end; yet, after all this feverish effort, he is apparently what is popularly known as "left." A hard fate truly after so great effort; yet by no means discouraging to the unfortunate army of taxpayers.

* * *

THE results of the recent boycott trials in this city would serve to show that force and intimidation in a free country will prove a failure. So far four boycotters are adjudged guilty, and the cheering outlook is that the many to follow will meet with the same legal decision; which will deprive the law-abiding community of their society for the terms mentioned in their respective sentences.

* * *

THERE seems at present to be a comparative armistice in the rate-wars, which, if only permanent, would be an admirable thing. The customary throat-cutting war of rates can only react injuriously upon those engaged in the battle; and eventually indeed can effect good to no one—not even the travelers over the various lines involved. A rate-war is always disastrous to all interested.

* * *

THE late general reports of all companies show an encouraging increase in miles of line built, and improvements generally throughout. In every department work appears to be brisk, and gives encouraging promise of a satisfactory return.

* * *

THE steel-tie question appears to be coming to the front. Recent experiments seem to show that the question of economy, viewed from every side, favors the steel tie. Rust, of course, attacks it, but balancing the loss chargeable to damp against the corresponding damage to a wooden tie, the balance would seem much in favor of the former. Taking it "by and large," as the sailors say, it is more than very probable that in the end the steel or metal tie will prove much the most economical in the long run.

* * *

THE future for steel and iron seems bright and satisfactory. Orders are crowding in, while the prices for production are far better than a short time since, when every ton was turned out at a dead loss.

THE June *Century* is an unusually interesting number. The war series is continued in four illustrated articles: "Stonewall Jackson in Maryland," by Colonel Henry Kyd Douglas; "Harper's Ferry and Sharpsburg," by General John G. Walker; "The Invasion of Maryland," by General Longstreet, and "Antietam Scenes," by Charles Carleton Coffin. Among the remaining illustrated articles in this number are "A Literary Ramble.—Along the Thames from Fulham to Chiswick," by Austin Dobson; part two of "American Country Dwellings," by Mrs. Schuyler Van Rensselaer; "Harvard's Botanic Garden and its Botanists," by Ernest Ingersoll, and "Birds' Eggs," by John Burroughs. A collection of unpublished letters of Benjamin Franklin, edited by John Bigelow, is a valuable contribution to the number, and a beautiful engraving of a bust of the old philosopher is furnished as a frontispiece.

Outing for June is as charming as ever, if indeed we may not say more so. The articles and illustrations are equally readable and attractive, and where everything is so good it is difficult to make an award of merit. Mr. Roosevelt continues his "Ranch Life and Game Shooting in the West," as does Mr. Stevens his account of his trip on a bicycle around the globe, both excellently illustrated. The other features of the issue deservedly add to its attractiveness, and seem to demonstrate the well-deserved popularity which the magazine has so quickly attained.

"POOR'S Directory of Railway Officials and Railway Directors for 1886," is in no way inferior and in many points superior to the former editions of the same work. The present issue is thorough and complete in all respects, and to the man desiring railway information it is a cyclopædia of general and valuable information well worthy the possession of the most scientific.

"CANADA; its History, Productions and Natural Resources," published by the Department of Agriculture of Canada, Ottawa, 1886, is an admirable reflex of the general and material growth of the country for the period included, containing much valuable statistic and general information, in addition to an admirable map of the Canadian Dominion.

THE *Illustrated Graphic News* of Chicago for the 19th, is a thoroughly readable and interesting number. The illustrations and matter relating to scenes and life in Georgia are well conceived and admirably rendered, while throughout the issue is good, both in matter and drawing, the supplement deserving special mention,

Street-Railways.

American Street-Railway Association.

President.—Julius S. Walsh, President Citizens' Railway Company, St. Louis, Mo.

First Vice-President.—William White, President Dry Dock, East Broadway and Battery Railroad Company, New York City.

Second Vice-President.—C. B. Holmes, President Chicago City Railway Company, Chicago, Ill.

Third Vice-President.—Samuel Little, Treasurer Highland Street-Railway Company, Boston, Mass.

Secretary and Treasurer.—William J. Richardson, Secretary Atlantic Avenue Railroad Company, Brooklyn, N. Y.

Office of the Association, cor. Atlantic and Third Avenues, Brooklyn, N.Y.

The Fifth Annual Convention of the Association will meet in Cincinnati, O., on Wednesday, October 20th, 1886.

A JUST STRIKE.

TO fully illustrate the trite and ancient saying that "might is right," it is but necessary to note the almost instant success of the street-car drivers' strike in Minneapolis for the privilege of sitting down. Almost without exception the strikes in the last three months have been actuated simply by either a desire on the strikers' part to show wholly arbitrary power, or by a similar ambition on the part of those having in their hands the management of the various strikes.

In nearly every case as described dismal failure has been the only result. Those having the handling and ordering of the strikes in charge made the egregious error of supposing that merely because the combatant wins in one instance, he is consequently invincible in all. This preposterous deduction was without doubt drawn from the instantaneous success resulting from the great general tie-up of a few months since in this city, when the demand of the dissatisfied employés being simply based on a rock foundation of common humanity as to a fair and reasonable number of hours of work, the public, quick to join with justice, recognized the fairness of the claim, and through that "tower of strength" an ample victory was won.

Instead, however, of recognizing the true grounds of success herein, the army of workers foolishly concluded that the result was effected purely from their own inherent power and strength; and consequently arrived at the absurd conclusion that themselves being inherently and only the sinews of war, they were—irrespective of justness of cause—the stronger of the combatants, and *ergo*, must be the victors.

So unfounded a view, however, cannot long be maintained in face of facts. The subsequent strikes taught the fomentors thereof that without public sympathy any position taken is weak and the cause doomed to failure. No clearer proof could be desired of the truth of this axiom than the dismal distress and failure resulting from the last Third Avenue strike, where the grounds of complaint were utterly without strength or justice.

There are, however, two sides to this question. Just as above mentioned, the strikers made the grave error of mistaking for inherent strength the success which in the first instance was theirs simply through public sympathy, so in the latter, the companies are plainly falling into the same grievous error. It is reported that on our local roads that managers, encouraged by recent strike-failures, are contemplating restoring working hours, etc., to the old ante-strike standard. This would be a grave error; for, as we have said before, the whole question of success in strikes balances on the scale of public opinion.

This is plainly shown in the instance we employ to illustrate our point. The Minneapolis drivers struck for the privilege of sitting down when duty permitted. Herein they were in the right, and being right had with them public sentiment, which resulted in inevitable victory.

The strikers were out scarcely twenty-four hours when they accomplished an unconditional triumph, simply through their claim having justice on its side. The moral is so plain that it seems almost superfluous to give it life in type; still, to recapitulate, we see that be the party employer or employed, to gain success requires the grand desideratum of *right*, thereby winning to its side that greatest ally—*public*.

THE city appears to have at last forced the Broadway surface road to a payment of $40,000 for its share of profits. The sum is small enough in all conscience, but the present handlers of the road made as strong a fight as if resisting a most outrageous piece of oppressive municipal power. To the uninitiated it is amazing that such a question should be so long in dispute, but, perhaps, it may be as well to avoid useless controversy, and be thankful for small favors. Compared to former times, at any rate, the result is not so bad.

* * *

ALL street-car lines at present seem strangely quiet after the war-like attitudes so lately assumed by the workmen thereon. Experience seems to have taught the folly of attempting to enforce an unjust demand; and if this fact be really learned, the strikes of the last six months will have fairly paid their way.

* * *

THE movement lately started to make all fares on the "L" roads five cents at all times, is well worthy of consideration. The elevated roads have proved of vast good to the town, and while no one desires in however slight degree to curtail a fair profit from the stockholders, yet experience has shown that every similar projected change has been met with a like outcry and opposition on the

part of those supposed to be principally interested. In spite of all this, when the public has downtrodden all opposition, strange to relate, in a month or two the roads themselves have become quite reconciled to the change, and their books show no decrease in profit. Might it not be as well to keep these facts in mind when the question is again to the fore? Certainly it would seem so.

* * *

JUDGING from the newspapers it would seem that Mr. RICHMOND is selected as the sacrifice at the next court festival, to the utter exclusion of the ambitious Mr. SHARP. This, so far as it goes, is gratifying, but scarcely poetic justice, since reports say on good authority that the redoubtable Mr. S. has been religiously stricken, and, consequently, feeling the unfitness of his former associates, has arrived at the conclusion that so far as he personally is concerned, they represent the historical JONAH. Like any good business man under similar circumstances he promptly fires them overboard. While one may heartily regret the success of the scriptural device, we still may hold one comforting reflection: JONAH'S gone overboard.

LABOR AND THE STREET-RAILWAYS.

BY L. CHRIS. HENDERSON.

[Written for the AMERICAN RAILROAD JOURNAL.]

THAT the country is in an extremely critical condition seems to be acknowledged on every hand. The recent strike in New York and Brooklyn, which paralyzed for a time nearly all the internal communication of the two cities, demonstrated at once the strength and the weakness of the labor organizations. That the union was able at a word to tie up all the roads without an exception worth mentioning, demonstrated an almost unsuspected power in the unions. But the result of this strike has been to greatly weaken the union and lessen the faith of the men in their leaders.

The possibilities of the labor union, as shown in the recent troubles, are beyond the wildest dreams which have been painted by sanguine authors in the past. Nothing which Charles Reade described in "Put Yourself in His Place," is impossible; indeed the worst appears to be more than probable.

In case the Knights of Labor fall into the hands of the politicians, it seems highly probable that their methods will become legalized, although the Knights will, like other organizations of the kind, be sold out to the highest bidder.

The injury which will result to the community from such a result is hardly to be calculated. Even a very partial success will be little less than a social revolution. An entire accomplishment of the schemes now under consideration would involve consequences of which we cannot now form any conception.

Reading the history of the last twenty years in the light of recent events, it would seem that the close of the 19th century was to see a repetition of the conditions which preceded the terrible outbreaks at the end of the 18th century. Whether these conditions shall be productive of a social and political volcano, or of a new and better order of things, depends largely upon the men who are now handling capital and employing labor. While the conservative and wealthy are the most numerous in the community, it unfortunately happens that the weapons in the hands of the minority are most powerful and deadly, and against them no shield nor armor has as yet been devised.

One of the living questions with which street-railway capital finds itself called upon to answer is, "Can our relations with labor be changed for the better?" "Can these new relations be made mutually profitable?" Evidently things cannot go on as they are. These great strikes will probably end in such a large and general reduction of wages, that the men will be upon the point of starvation. With the voting power and dynamite in the hands of such men the results are not pleasant to contemplate.

If capital undertakes the matter in earnest, cannot these men be enabled to earn more money? Cannot such inducements be held out to them that they will have a selfish personal interest in the success of the roads on which they work, and at once be protected from the evil influences of the demagogues and made powerful allies of their employers.

That there are good men who are worth a large percentage more than others every superintendent knows. And it is generally acknowledged that improvement is possible to most men. Is it not possible then to devise some scheme which will permit the companies to pay higher wages, and, at the same time, to get a corresponding increase of value from their labor. If this is not possible, cannot means be devised for improving the condition of the men and making their positions more valuable to them. By means of large capital much may be done at a very small expense. Whatever tends to raise the social condition of the men is of as great benefit as that which is purely monetary. The plan adopted on some of the eastern roads seems to have the germ of an idea which is widely applicable, and which may result in great good both to the companies and men. The plan is to gradually advance wages according to the length of service. In this way old and faithful employés have a very material advance over those who are just beginning. This idea of recognizing long and faithful service in a substantial way has a strong beneficial effect upon men of all classes.

Since writing the above Mr. Hart, of the Third Avenue road, in this city, has announced that the strike on his roads is practically at an end, and he says he thinks it highly improbable that any further trouble will be encountered. The Third Avenue strike has undoubtedly broken down, but it by no means follows that the end of the trouble has been reached. This particular company may be in such a position that for some years to come their men cannot be induced to enter the union. This, however, is not an end of the trouble. The enormous power in the hands of the Knights of Labor has been demonstrated, and it cannot long escape the grasp of some really able and powerful man. In such hands the country cannot long escape the worst results.

While individual roads may, for a time, put such a

pressure on their men as to remove them from the influence of the labor organizations, they cannot do this for any considerable period if their present policy toward their men is continued.

The question which the companies are now facing is whether it is not expedient to employ means which will permanently take their men beyond the reach of the unions and labor organizations, rather than to allow things to go on in the old way regardless of the evils which are impending.

HONESTY.

BY E. P. WILLIAMS.

[Written for the AMERICAN RAILROAD JOURNAL.]

AT one of the meetings of the Street-Railway Association Mr. White, the well-known street-railway man, spoke of the need of teaching the public honesty. He spoke of the wide-spread tendency which he found to beat the company out of five cents whenever it was possible to do so. While this is no doubt a crying evil, would it not be well for the companies to set the example of honest dealing? The passenger now and then cheats the road out of a fare, but the roads are prone to cheat the public. One of the most flagrant examples of petty cheating is to be found on the Grand Street line in New York City. This road runs to the Grand street ferry, and, in wet weather, is heavily patronized by those who wish to cross the river. At the busy hours at night instead of going to the end of the line the cars stop and the passengers are obliged to get out from one to two blocks and of en three blocks away from the ferry houses. There are, no doubt, good excuses in the minds of the managers, but every passenger feels himself aggravated and swindled when the car stops two or three blocks from the ferry, and he is obliged to walk in the rain a portion of the distance for which he has paid a fare. There is an old and very trite saying about charity beginning at home. Perhaps if our railway companies were more strictly honest in their dealings with the public, they would have less difficulty in preventing the public from "beating" them out of these fares. Injustice on the part of a corporation in the end is punished by the public. Commonly, the punishment is much out of proportion to the cause, and the corporation has to pay dearly for its errors.

Electricity in Ireland.

AN electric railroad has been in successful daily operation in the north of Ireland since November 5, 1883. It starts from the railroad terminus of the Northern Counties Railway, at Portrush, in the county of Antrim, and runs along the magnificent coast road to Brushmills, a distance of six miles, ending within a short distance of the Giant's Causeway. The total length of the way, including the branch way, to the harbor of Portrush, and the several sidings, is upward of seven miles. The road is one continuous series of long inclines. Grades of one in forty-five and one in forty are frequent for upward of a mile in length, while steeper grades of one in thirty exist for shorter distances, the worst grade being one in twenty-five. The summit level occurs about midway, at an elevation of about 160 feet above either terminus, the total rise from the depot at Portrush to the summit being 203 feet. Some sharp curves exist along the line, the worst one having a radius of about forty feet. There was some doubt in the mind of Sir William Siemens, the constructor of the line whether with the arrangements adopted these inclines could be worked satisfactorily; but experience has proved that they can be, and the car, when fully loaded, is drawn up the grades without difficulty. There are seven "passing places" along the line, where the "points" are set so that the cars traveling in opposite directions always take their own sides respectively.

At first the power was produced by a steam-engine at Portrush, giving motion to a shuntwound dynamo of twenty horse-power, but arrangements were subsequently made to utilize a waterfall of ample power on the river Rush, situated sixteen hundred yards from the nearest point of the tramway and six and a half miles from Portrush. A fall of twenty-six feet head of water is used to drive two turbines each capable of working up to fifty-two horse-power.

A speed of ten miles an hour is readily obtained. Mr. Traill, the Engineer of this road, told the Inventors' Institute last year that, after repeated failures, they had at last hit on a thoroughly trustworthy plan for getting electricity from the conductor. This was by means of a steel spring in the form of a carriage spring. Two concave steel springs were fastened at the top and rubbed along the bottom. His cars had then successfully traveled over 30,000 miles with 100,000 passengers. The cost of electricity generated by water power a mile distant was one-quarter that of steam used on the same railroad.

It is said that the construction of this road cost $225,000; that it is paying a 12 per cent. dividend, and that the working expenses are five cents per train mile. An extension of six miles is contemplated.—LAKE, in *Electric Railways*.

A New Cable System.

THE *Railway Reporter* says: "Charles W. Rasmusen, of Chicago, who has just been sent to an insane asylum after a long spell of sickness from typhoid fever, is the inventor of a cable system for street-railways, which, although it has not been practically tested, it is said, is radically different from the one in use in this city, or anywhere else, and can be constructed at a minimum of cost. The Rasmusen system may be thus briefly summarized:

"Any existing track is available throughout, no change being necessary. No interference with public traffic, and no loss of revenue is caused during construction, the channel for the travel of the cable consisting merely of a tube six by nine inches, which can be laid at the rate of one mile per day, and consists of three sections of rolled iron plate spiked to the cross-ties. The city sewer, gas or water pipes are in no instance displaced, and only one man-hole for each 300 feet of double track is necessary. No extra cars or grip-cars are required, the ordinary street-car being available, either closed or open, as the season may require. The operator stands on the front platform, having the entire roadway ahead in view, enabling him to see passengers and avoid accidents. One hand-wheel operates both grip and brake. At the same

turn of the hand-wheel the cable is released and the brake on the car-wheels applied, or *vice versa*. The cable is always in direct line; there is no downward strain on the car, but it runs as easily as a horse-car, while the grip in the present system must, in order to pass the stationary pulleys, lift the cable nine inches above its direct line of travel, causing a downward strain, which causes the car to run heavily and pound on the rail-joints. No extra supervision or care is necessary to connect the car with the cable at starting points or sections, and it is impossible to miss the connection. Any man who can turn an ordinary hand-wheel is sufficiently skilled to run the cars. As the cable is not gripped it will not get stranded, besides which, the trucks being clamped firmly to the cable every sixteen feet add considerably to its stability. No stationary pulleys are used, but in their stead a two-wheeled truck is clamped direct to the cable and travels with it. The highest estimated cost of construction is $14,000 per mile. The nature of the surface does not change the cost. The cost of construction of the present system in Chicago is reported by the president to have been $105,000 per mile of single track."

Snow in London.

ACCORDING to a late issue of the *Street Railway Journal*, the Londoners who go to pieces badly on a fall of five or six inches of snow, are very much pleased with the working of the cable road they have; it was about the only mode of locomotion, except the underground, that was not interrupted during their late storm.

Iron asserts that they ran without difficulty and that the superintendent wished for more snow so that he could show what he could do, and that on Highgate Hill, grade 1 in 11, where teams of six horses could not pull four tons, the vehicles were attached to the cable cars and were drawn up without difficulty.

This is in effect the same experience had last winter in Chicago, until the shaft of their winding engine broke down. In spite of the intense cold, and drifts, said to have been six feet deep, the cable pulled the cars steadily through, until the four 24 x 48-inch cylinders twisted off the shaft of their winding-drums. This year they have added two 30 x 60-inch cylinders and strengthened their shaft, proposing to pull their cars through anything that any blizzard may bring.

The difficulty experienced by street-railways with a heavy snow storm, and the continual fight existing at all times regarding the use of salt, renders any suggestion for the lessening of the trouble, of interest. In Vienna, which although far from being a model of cleanliness, there is a system in use for the removal of snow that is worth copying, as the rapidity with which the work is accomplished is truly remarkable.

An Electric Motor.

A DECIDED departure from the practice hitherto followed in the construction of electric machines for working tramways has recently been introduced in an electric locomotive on the London (England) North Metropolitan Tramway, by a Mr. Elieson. The London *Times* refers to this new device as follows: "Instead of the electric motor being a fixture, and having motion transmitted from it through belt gearing to the wheels of the car, the motor itself revolves, the motion being transmitted through bevel gearing. The system is the invention of Mr. Elieson, and the locomotive has been built by the Electric Locomotive and Power Company, of London. The locomotive is similar in appearance to a short tram-car, and carries a secondary battery, consisting of fifty cells. This battery is connected up with the electric motor, the motion shaft of which projects horizontally about two feet, and carries at its end a spur-wheel, which gears into a fixed circular rack. Thus when the motor is started it is, by means of this gearing, rotated. A vertical shaft is attached to the under side of the motor, carrying at its lower end a bevel-wheel which gears into one or other of two similar wheels on the driving-axle of the engine. The mitre gearing is fitted with a friction-clutch, by means of which the locomotive can be run either backward or forward. The fifty cells are equal to 280 amperes, and as the average consumption is stated to be forty-five amperes per hour, it follows that there is a good six hours' supply of power carried. The machinery is so arranged that a speed of eight miles an hour cannot be exceeded. Both the locomotive and the tram-car can be electrically lighted at night from the battery by means of glow lamps. We recently inspected the working of this locomotive at the tramway company's depot at Stratford, which was satisfactory in the limited space at command. It was started, stopped and reversed very readily. The machinery is of a simple character, and can be adapted to the tram-car itself in new stock. The electric locomotive company are building a more powerful engine, in order to demonstrate the application of the system on railway lines."—*Street-Railway Journal.*

Glanders and Farcy.

ACCORDING to the *Scientific American* the Tennessee State Board of Health in its bulletin for March, commends the health officer of Nashville for his prompt destruction of three animals affected with glanders.

The board calls the attention of other local authorities to the importance of the immediate destruction of all animals affected with the disease. Glanders and farcy are two names denoting really one disease, due to the same specific poison. It is called glanders when the air passages are affected, and farcy when the skin, areolar tissue, lymphatics and glands are most prominently involved. Damp, ill-ventilated, narrow, and ill-built stables, insufficient or unwholesome food, and excessive fatigue are the principal predisposing causes to the development and propagation of the disease. It invariably terminates in death, whether it appears in the acute or chronic form. Its communicability from one horse to another, from the horse to man, and from man to man, is now no longer questioned; hence health officers should act with great promptness in every case, rigidly enforcing isolation in regard to all "suspects" and extermination of all animals known to be affected.

The German law directs that any horse which has been *even in contact* with a glandered animal shall be *immediately* killed. This is wise. When the horse is killed, it should *at once* be buried deep in plenty of lime, and its

former habitation thoroughly disinfected, first with sulphurous acid fumes, followed by prolonged free ventilation. All tainted food, bedding, etc., should be speedily burned.

The Berlin City Elevated Railroad.

THE Berlin City Railroad (elevated) has been in operation four years, crossing the city from east to west and being a thoroughfare for through and suburban trains as well as for purely city traffic. The purely city trains are 280 daily; the suburban 74, and the others 90, so that 444 trains are dispatched daily. It is a four-track road on a solid masonry viaduct. On summer Sundays 72 extra trains are sometimes run, and as many as 562 have been dispatched in one day. (There have been more than 800 regularly on a double-track line of the New York Elevated.) The number of passengers on the Berlin road was 8,396,460 the first year, and 14,256,490 in 1884-85. The four New York elevated roads carried 103,354,729, and of these 48,399,496 were carried by the Third Avenue line, which is about 8½ miles long. From 400 to 500 employés are engaged on the Berlin road and 54 locomotives are constantly in service.

Obligatory Arbitration.

THE principle and the method of voluntary arbitration are best suited to our country, but it is going beyond the record to assert, as a contemporary does, that "compulsory arbitration is an absurdity—there is no such thing." The French arbitration laws, as we have heretofore shown, have been in operation since the time of Napoleon. Under them arbitration is compulsory, on the application of either party to a dispute, and the decisions of the boards or courts organized for this purpose have the same force as those of courts of law. They are constituted by the authority of the Minister of Commerce, through the chambers of commerce, which are established at important trade or manufacturing centers, says a recent writer on this subject, and are composed of "an equal number of employers and workingmen members, each class electing its own representative, with a president and vice-president named by the government." The authority of these boards extends to every question that can arise in the workshop, with one exception—the future rate of wages; and "even this can be done by mutual agreement." More than 90 per cent. of the cases brought before them are settled by agreement. Forty years ago, according to another writer, there were sixty-nine councils called into existence in one year, which had nearly 20,000 cases before them, and in only 529 cases was it necessary to have formal judgment, the others being settled by "conciliation." Of the cases brought before the councils in 1878, 21,368 were relative to wages, 4,733 to dismissals, and 1,795 to apprentices. In 1883, a year of unusual disturbances, the great number of 263,000 cases were considered by these tribunals, "and with very few exceptions, satisfactorily adjusted by them, thereby avoiding an untold number of possible strikes and lockouts." As suggested by Mr. Carnegie for this country, pending arbitration, work and wages go on, the award taking effect from the time the inquiry begins. The councils, it is added, are usually presided over by "lay judges," tradesmen, manufacturers or merchants, aided by clerks experienced in these hearings. In troubles relating to railways, either horse or steam, or to other enterprises involving the needs and convenience of the public, a little compulsion toward a settlement may yet be found necessary in this country.—*Boston Herald.*

The Suburban Rapid Transit Railroad.

NEW YORK is opening another avenue to success in rapid transit in the Second Avenue Elevated Railway. With the title of the Suburban Rapid Transit Railroad, it runs away across the Harlem River to a thickly settled region, upon a new bridge, an airy iron way towering high above the earth, and gradually diminishing brick piers. It is safe and swift, and has reached 134th street now. In less than a month it will be at 143d street.

STREET-RAILWAY NEWS.

ALABAMA.

THE Capitol City Street-Railroad Company, of Montgomery, is so satisfied with the working of one of its lines by electricity after a month's trial, that it has contracted with the Van De Poele Electric Manufacturing Company, of Chicago, to equip all the lines. This will be the first city in the States to have all its street-cars run by electricity.

The Elyton Land Company's Boulevard street-railway has recently been opened. The line runs through the Highlands, connecting the town with that suburb and Lakeview Park. The line is to be worked by dummy engines.

At Birmingham a street-railway company is to be chartered by J. C. Westbrook and others.

FLORIDA.

The Palatka Street-Railroad Company has been incorporated.

GEORGIA.

The Macon Street-Railway is to be double-tracked as far as possible, and a large number of switches are to be put in to do away with the present delays.

The Metropolitan Street-Railroad Company, of Atlanta, has commenced giving concerts at Grant Park, to which place its cars run.

ILLINOIS.

The Chicago Passenger Railroad Company has completed its extension east to Wabash avenue, and will soon be completed west to Michigan avenue.

The West Side Street-Railroad Company, of Chicago, has nearly completed its West Division street line.

The North Chicago Street-Railroad Company's system is to be converted to a cable line. The road was purchased recently by Mr. Charles Yerkes and others, of Philadelphia.

The Chicago Electric Elevated Railroad Company has been incorporated to build a line from the center of the town to Hyde Park, Union Stock Yards, Riverside, Brighton Park, Evanston, etc. Capital, $5,000,000.

The Ottawa Street-Railroad Company has been incorporated by Frederick A. Sherwood and others. Capital stock, $30,000.

INDIANA.

At Logansport the street-railway company has petitioned the council for the exclusive power to use electricity or hot-air as tractive power. The company intends to do away with mules.

MASSACHUSETTS.

At Boston the Meigs elevated line has been successfully tried before a legislative committee; the train passing the sharpest curve and the heavy grade of 345 feet to the mile with perfect ease.

At Gloucester the car-stables are nearly completed and cars are running between Eastern Point and the depot.

The Natick and Cochituate Street-Railroad Company has elected the following directors at its first annual meeting: Harrison Harwood, William H. Bent, George S. Trowbridge, O. A. Felch, Frank H. Hayes, George F. Keep, and John O. Wilson.

The Naumkeag Street-Railroad Company has opened its branch to Wenham.

At New Marlboro the Konkapot Railroad Company is to be incorporated. Capital not to be less than $50,000, nor more than $150,000.

The proposed street-railway between Adams and North Adams has been abandoned.

MICHIGAN.

The Battle Creek Street-Railroad Company has been incorporated by H. H. Brown, Lucius Clark, South Bend, Ind., and H. C. Miller, Chicago. Capital, $35,000.

At Detroit a company has been organized to build a street-railway from the end of the Congress street line to the suburban town of Springwells. The line is to be worked by electric motors.

MISSOURI.

The Kansas City Cable Railroad Company has elected the following officials: President, W. J. Smith; Vice-President, P. A. Chase, of Boston; Secretary, W. H Lucas; Chief Engineer, Clift. Wise.

At St. Louis the Mallinckrodt brake is being experimented with on the Fifth street line. The driver can stop gently on ordinary occasions, but upon emergency can stop the car in from three to six feet.

NEBRASKA.

The Omaha Tramway Company has decided to build two miles of line at once and to erect a building for the plant.

NEW HAMPSHIRE.

At East Manchester the street-railway is to be extended along Hall and Park streets to Massabesic street.

At Nashua the street-railway company has held its first annual meeting and reëlected the same board. The cost of construction has been $16,350. The tracks are now laid to the railway depot.

NEW JERSEY.

The cars will be run as usual on the Beach Point Railroad, the difficulties which threatened the road having been disposed of.

NEW YORK.

The Arcade Railway Bill has received the Governor's signature. There are to be four standard-gauge tracks, and the cost is estimated at $40,000,000; the road is to be completed in five years. Electricity will be the motive-power.

The Broadway Railroad Company's charter has been canceled. The president of the company has resigned and Mr. O'Brien has been appointed receiver, but the directors refuse to recognize his authority; he has not ordered the taking off of the cars, out of regard for the public convenience. Interesting legal operations are pending.

The Suburban Rapid Transit Company has opened for traffic the first mile of its road, including the new Second avenue bridge.

The Tenth avenue cable cars are expected to be running to Eighth avenue soon, avoiding the present change from horse to cable traction at Tenth avenue.

The Atlantic Avenue Railroad Company, Brooklyn, has been authorized to purchase the Prospect Park and Coney Island Railroad.

The East New York, Bay Side and Ozone Park Railroad Company is about to lay its tracks in New Lots, L. I.

A street-railway is to be built between Valatie and Niverville. For particulars, inquire of L. Sniffen, of Valatie.

OHIO.

At Cincinnati work has been commenced on the cable road trench at Fountain square. Work is progressing at the Walnut Hills end of the line.

PENNSYLVANIA.

The Germantown Passenger Railroad Company stockholders are dissatisfied with the management of that corporation by the People's Company, and propose to contest for control of the board at the annual meeting. A compromise may, however, be effected.

The Scranton Suburban Railroad Company has been incorporated.

WISCONSIN.

At Eau Claire the street-railway is to be extended, one extension is to be in the sixth ward on account of the rapid settlement of that district.

At Neenah work on the street-railway has been delayed by the keeping of the rails at Bay View, owing to the strike. It is not yet decided whether the line will be worked by electricity or horses.

CANADA.

The Montreal City Passenger Railway Bill has been passed, including power to erect an elevated road.

At Toronto the street-railway strikers have started stage lines. On May 25th the mob wrecked 40 cars.

FOREIGN.

The city of Glasgow (Scotland) owns fourteen miles of street-railway, which bring an annual rental of $76,000. The fare is two cents per mile, with reduced rates morning and evening when the working people travel. The original purpose of the system was to enable workingmen to reside in the suburbs.

At Singapore (Straits Settlements) the surface railway from Tanjong Pagar to Elgin bridge was opened by the Governor on April 21st. The line is worked by steam and there are 20 engines by Kitson & Co., Leeds, Eng., and 20 cars by the Saltley Car and Wagon Company, Birmingham, Eng.

New Inventions.

Unangst's Railway Alarm-Signal.

HENRY S. UNANGST, of Phillipsburgh, N. J., is the inventor of a new and improved form of railway alarm-signal, the construction and operation of which is herewith illustrated and described. The invention relates to an improvement in railway alarm-signals for low overhead-bridges, designed to give an alarm to brakemen on top of freight-cars before approaching a low bridge; and it consists in the peculiar construction and combination of parts hereinafter shown and set forth.

In the accompanying cuts, Fig. 1 is an elevation view of a railway-signal embodying the invention; Fig. 2 is a perspective view of the same, and Fig. 3 is a horizontal section on the line *x x* of Fig. 2.

A represents a vertical post of suitable height, which is located on one side of the railway-track, and is provided near its lower end with a bracket or bearing B, in which is journaled one end of a horizontal shaft C. The other

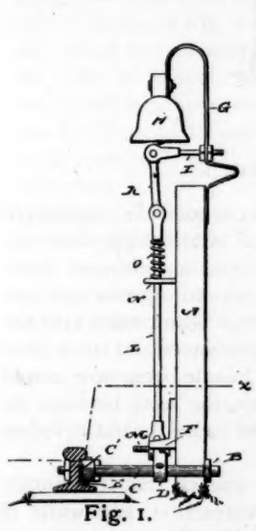

Fig. 1.

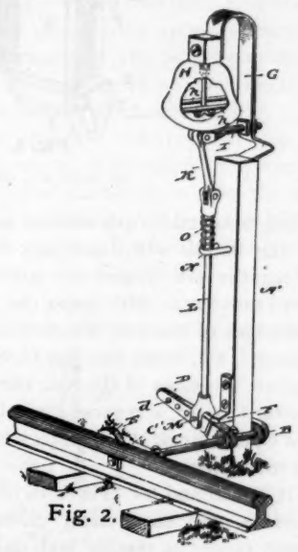

Fig. 2.

UNANGST'S RAILWAY ALARM-SIGNAL.

end of the said shaft is journaled in a transverse opening, which is made in the web of one of the railway-rails, and the said shaft carries a tappet-arm C′, which bears against the outer side of the track, and also a lever-arm D. To the outer end of the tappet-arm is journaled an anti-friction roller E, the upper edge of which extends normally a slight distance above the upper side of the rail. The lever-arm D, is provided with a series of transverse openings *d*. A stop F, is secured to the inner side of the post A, near the lower end thereof, and limits the upward movement of the lever-arm D. To the upper end of the post A, is secured a flat spring or arm G, which is bent in the form shown in Fig. 2, and has a bell H, secured to its free upper end. The clapper of this bell moves in guides *h*, which prevents rotary movement of the clapper, and insures its striking against the side of the bell and sounding an alarm. An arm I, is secured to the spring G, at a point above the upper end of the post, and to the outer end of the said arm is pivoted a link K. The lower end of this link is connected to a vertically-movable rod L, the lower end of which rod is attached to the lever-arm D, by means of a transverse pin or bolt M, which passes through the lower end of the rod L, and through either of the series of openings *d*. The rod L, is guided by a keeper N, which is secured on the inner side of the post, and the said rod is provided at its upper end with an extensile coiled spring O, which bears between the keeper and a shoulder formed on the rod. The function of this spring is to keep the lever-arm and tappet-arm normally raised in the position shown in solid lines in the cuts.

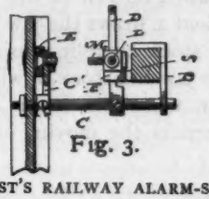

Fig. 3.

UNANGST'S RAILWAY ALARM-SIGNAL.

This signal is erected at some distance from a low overhead-bridge or other dangerous obstruction, and when a train approaches, its wheels, by passing over the friction-roller at the outer end of the tappet-arm, causes the said arm to be depressed, and thereby sounds the bell. As each wheel passes over the friction-roller the tappet-arm and lever-arms are raised by the resilience of the spring O. By adjusting the bolt M, in or out on the lever-arm the stroke of the bell may be regulated. The clapper of the bell may be preferably hung on a pivot, in place of by the two interlocking eyes as shown in Fig. 2, which gives better results.

It is claimed by the inventor that a railway-signal thus constructed, is automatic, simple, economical and thoroughly reliable, and perfectly answers the purposes for which it is required.

McNally's Wrench.

AUSTIN MCNALLY, of Cascade, Iowa, is the inventor of a new and improved form of wrench, which is herewith illustrated and described. This invention relates to improvements in nut-wrenches; and it consists in the details of construction and novel combination of parts fully set forth and shown below.

In the accompanying cuts, Fig. 1 is a perspective view of a wrench constructed in accordance with the invention; Fig. 2 is a side view of the same, partly in section; Fig. 3 is a perspective detail view of the pivoted and sliding-jaws.

The stock A, is of the usual form in cross-section, and is provided with a handle B, and ferrule C, at the junction of the handle and stock. The jaw D, has an opening *d*, formed longitudinally therethrough for the reception of the head of the stock, which is secured therein by a pivot *d′*. The opening is of sufficient size to permit of a slight vibratory motion of the jaw, for the purpose presently set forth. Wings D′, extend from the jaw D, on each side of the stock and terminate close to the ferrule. These wings are slightly wider than the stock and are of a uniform width throughout their length. A clip E, uniting the lower ends of the wings, is provided with a socket E′, on one side and a cam-lever F, on the other or opposite side, which lever is pivoted between the ends of the clip, and of a width to bear on the upper side of the stock.

The sliding-jaw G, is held in place on the wings of the pivoted jaw by hooks H. This jaw has a movement to and from the jaw D, on the wings D′, which form guides, and a second movement to and from the stock as the jaw D, is vibrated about its pivot. The jaw G, has an extension G′, which rests on the edges of the wings. Teeth *g*, on the face of the extension G′, adjacent the stock, are adapted to engage a tooth or teeth *a*, on the under side of the stock, thereby preventing the further movement of the sliding-jaw during the contacting of the teeth on the two parts.

The cam-lever, when thrown in the position shown by full lines, Figs. 1 and 2, draws the jaw G, into closer relationship with the stock, thereby causing an engagement of the teeth on the jaw and stock, as will be readily understood. The lever, when thrown in a position parallel with the stock, permits the moving of the jaw D, on its

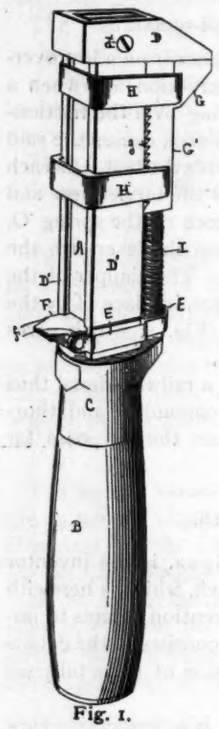

Fig. 1.

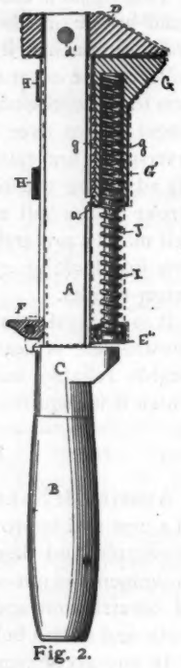

Fig. 2.

MCNALLY'S WRENCH.

pivotal connection with the head of the stock and leaves the jaw G, free to be moved to and from the jaw D, as desired. The jaw G, and its shank have a longitudinal bore *g′*, formed therein, and a coil-spring I, seated in said bore, extends to and finds a seat for its protruding end in the socket E′. A bolt J, having its head resting in said socket, passes through the spring and projects part way on to the bore *g′*, of the jaw G, when the latter is closed, as shown more clearly in Fig. 2. The spring rests on the head of the bolt and prevents the latter from becoming displaced.

The spring always exerts a force to keep the jaws closed; hence when the jaw G, is disengaged from the stock by the cam-lever said spring will carry the jaw up against the jaw D. The cam-lever, when it occupies a position at nearly right angles to the stock, locks the jaw in place, and to prevent the lever from turning too far wings *f*, projecting beyond the ends of the clip E, engage the sides of the same, which form a stop to limit its further movement. In practice the device may be used as a self-adjusting ratchet-wrench by throwing the lever in the position indicated by dotted lines, Fig. 2, and full lines, Fig. 3, or by dispensing with it altogether. In this case the jaw D, is free to vibrate on its pivotal connection with the stock, thereby engaging and disengaging the locking-teeth between the longitudinal moving jaw G, and the stock A. When thus disengaged the spring I, forces the jaw G, up close to the jaw D.

The above conditions being borne in mind, the following operation will be readily understood. The wrench

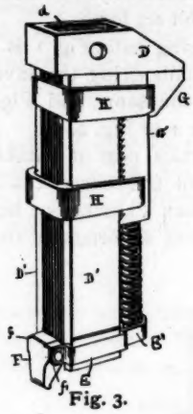

Fig. 3.

MCNALLY'S WRENCH.

being adjusted to any desired nut, a backward movement of the handle will disengage the interlocking teeth between the jaw G, and the stock, and a continued backward movement will cause the jaws to separate and ride the edges of the nut, which, having been passed over the spring I, will cause the jaw G, to advance and come close against the sides of the nut, the handle being now moved forward or in a reverse direction, the teeth between the jaw G, and stock will interlock and cause the nut to follow its movement.

It is claimed for this form of wrench that it is simple, durable, and economical in construction, and while of great power is readily and quickly adjusted to any nut within its gauge, giving a sure and powerful grip, without risk of slipping.

All inquiries and communications should be addressed to James A. Hayes, of Cascade, Iowa, to whom a one-half interest in the device has been assigned.

Shank's Car-Coupling.

JOHN SHANK, of Las Vegas, New Mexico, is the inventor of a new and improved form of car-coupling, which is herewith illustrated and described. This invention relates to an improvement in car-couplers. consisting of an ordinary draw-bar provided at its upper forward part with a pin-box and forwardly a projecting piece so disposed as to hold the link, and within the opening of the draw-bar a tongue having a suitable spring, so that the link may be be held in a horizontal position while in the act of coupling, all of which will now be fully set forth in detail.

In the accompanying cuts, Figs. 1 and 2 are sectional

views of a pair of car-couplers, showing the improvement thereon; and Fig. 3 a perspective view of the same.

A represents an ordinary draw-bar provided at its upper forward part with an upwardly-projecting pin-box B, of any suitable length.

Extending forward from the central opening C, of the pin-box, to receive therein the ordinary coupling-pin D, an opening E, is provided immediately over the connection of the said pin-box with the upper face of the draw-bar. Within this opening E, is provided a forwardly-projecting slide F, having its forward end G, upturned, forming

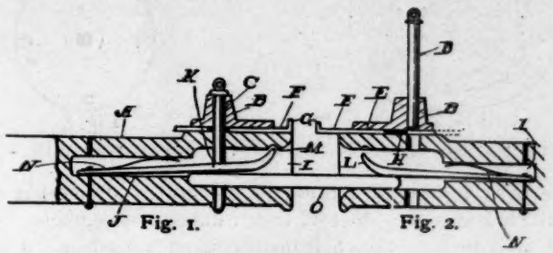

Fig. 1. Fig. 2.

SHANK'S CAR-COUPLING.

a lug, or a kind of a bumper. When this slide F, is drawn out, as shown in Fig. 2, the pin D, rests upon its rearward end, while immediately forward of the part upon which the said pin D, rests is an opening H, so that when the said slide is pushed rearwardly, as shown in Fig. 1. the pin D, will drop through this said opening. Within the usual opening I, of the draw-bar is provided an upwardly-projecting tongue J, secured rearwardly within the said opening. This tongue is provided with an opening K, immediately beneath the pin-box B, so that the pin D, may pass through, but not interefere therewith. The forward end of this tongue J, is upturned, as shown at L, so that when in use it will rest within the slight recess in

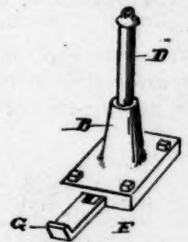

Fig. 3.

SHANK'S CAR-COUPLING.

the upper wall of the opening I. A spring N, is placed rearwardly within the opening I, upon the upper side of the tongue J, so that the normal position of the spring will be nearly horizontal, with the forward end pressing down upon the one end of the link O, sufficient to hold this said link nearly horizontal.

The opposite draw-bar, as shown in Fig. 2, has its sliding piece F, upheld out, with the pin D, resting upon its rear end. Then, as the draw-bars approach each other, as soon as the link O, enters the draw-bar the bumper G, of the sliding piece F, striking the opposite draw-bar, releases the pin D, when it drops down into the draw-bar and secures the link O, in position.

It is claimed for this form of car-coupling that it is simple, strong and economical, and can be readily attached to any ordinary form of car; while it will couple either on grades or curves.

The device is under the sole control of the inventor, to whom all inquiries and communications should be addressed.

Dickinson's Rotary-Chair for Railway-Carriages.

HENRY C. DICKINSON, of Springfield, Mass., is the inventor of a new and improved form of rotary-chair for railway-carriages, which is herewith illustrated and described. This invention relates to improvements in rotating chairs for railway-carriages and in means for operating the same; the object being to provide for railway and other carriages an improved rotating-chair and means for simultaneously rotating all of the chairs on one side of a car, to cause them to face in opposite directions.

In the accompanying cuts, Fig. 1 is a side elevation illustrating a portion of the inner side and the floor of a railway-car, and showing attached to the latter a chair and rotating mechanism connected therewith embodying this invention, the stand on which said chair is supported being shown in vertical section, and the chair-operating bar being shown broken off at the ends; Fig. 2 is an interior end elevation of a portion of a car, showing the

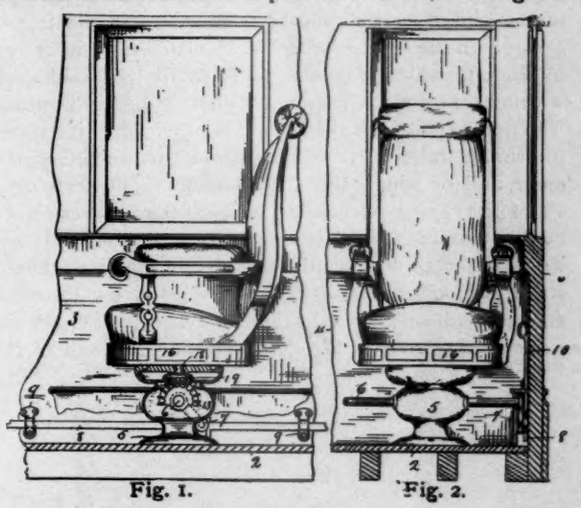

Fig. 1. Fig. 2.

DICKINSON'S ROTARY-CHAIR FOR RAILWAY-CARRIAGES.

side wall and the floor thereof in section, and showing the revolving chair in front elevation, and a portion of the operating mechanism for rotating the latter, hereinafter fully described; Fig. 3 is a front elevation, partly in section, of a pair of seat-frames, their stands, and mechanism for rotating said frames; Fig. 4 is a perspective view of portions of two of the chair-rotating shafts and the mechanism by which they are given a reciprocating rotary motion; Fig. 5 is a plan view of the top of the seat-frame, and Fig. 6 is a plan view of the top of the chair-stand.

In the cuts, 2 indicates a portion of the floor; and 3, of the side of a car; and 4 a part of the end thereof. Hollow chair-stands 5, preferably of iron, of vase or other suitable form, as shown, are secured to the floor 2, of the car, in single or double rows extending from one end of the car to the other on each side of the usual central passage between the seats of the car, according to the number of seats wanted between the passage and the side of the car. When two seats or chairs are arranged side by side, the chair-rotating mechanism of both is connected by a single shaft 6, as shown in Fig. 3, and where only one chair is

placed on each side of the passage, said shaft terminates within the stand of the chair. The shaft 6, extends transversely through the hollow stand 5, and has suitable bearings in the latter, in which it has a free reciprocating rotary motion. A crank-arm 7, is secured on one end of the shaft 6, having a pin in its end, which engages in a vertical slot in the sliding-bar 8, the latter being hung on a series of roller-supports 9, on the side of the car, in which it has a reciprocating movement, which is imparted to it by the lever 10, which is pivoted on the side of the

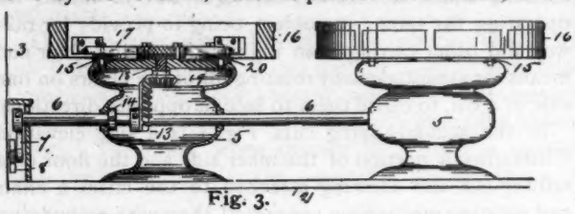

Fig. 3.

DICKINSON'S ROTARY-CHAIR FOR RAILWAY-CARRIAGES.

car and has a geared segment on its lower end which engages with and rotates a pinion 11, also pivoted on the side of the car, and said pinion engages with a rack 12, on one end of said sliding-bar. A geared segment 13, is secured on the shaft 6, within each chair-stand, as shown in Figs. 1 and 3. A collar 14, is secured on said shaft within said stand to retain the shaft in proper position. The upper end of the chair-stand is provided with a series of friction rollers 15, which sustain the weight of the chair, and on which the latter rotates. The seat-frame 16, of the chair is secured to a metal frame 17, as shown in Fig. 5, and a stud 18, is secured centrally on the latter, which projects downward through the top of the chair-stand, and on said stud is fixed a beveled pinion 19, which engages with said geared segment 13, on shaft 6. A circular bearing ring 20, is secured on the under side of the

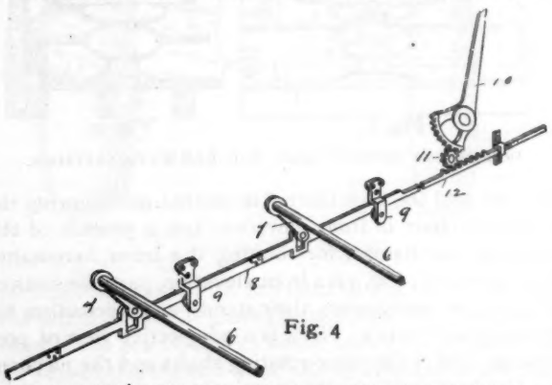

Fig. 4

DICKINSON'S ROTARY-CHAIR FOR RAILWAY-CARRIAGES.

seat-frame, over the said friction rollers on the chair-stand, forming a circular track for said rollers. The chair mounted on said seat-frame may be of the description shown in Figs. 1 and 2, or of any other desirable form which permits two thereof, when arranged side by side, to be rotated on the stands 5, as set forth.

The above-described construction of railway-car chairs and means for simultaneously rotating them to cause them to face in the direction of the movement of the car obviates the necessity of turning over car-seats one by one when the direction of the movement of the car is changed, and provides convenient means for providing one or two revolving chairs in the place of the usual long seat in a car, and for retaining said clairs in proper position.

The operation of this device is as follows: When it is desirable to reverse the chairs, the lever 10, is seized by the operator and swung on its pivot, thereby rotating the pinion 11, and the latter engaging with the rack 12, im-

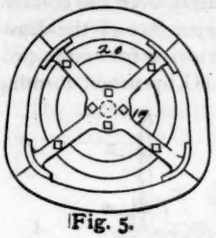

Fig. 5.

Fig. 6.

DICKINSON'S ROTARY-CHAIR FOR RAILWAY-CARRIAGES.

parts a longitudinal motion to the slotted sliding-bar 8, which rocks the shaft 6, and rotates the segment 13, thereby turning the chair on the stand 5, to bring it to the desired position.

It is claimed for this device that it is simple and durable in construction, and has the important and novel advantage of enabling all the seats in a car to be reversed and turned in the desired direction simultaneously, and by means of a single motion; while the arrangement adds greatly to the car's attractive appearance.

Flindall's Railroad-Rail Joint.

JOHN FLINDALL, of Morgan Park, Ill., is the inventor of a new and improved form of railroad-rail joint, which is herewith illustrated and described. The invention relates to railroad-rail joints; and it consists in certain peculiarities of the construction of the bolts and their fastening-nuts, as described.

In the accompanying cuts, Fig. 1 is an end view of the joint; Fig. 2 is a horizontal section of the same, and Figs. 3, 4 and 5 are detail views of the bolt, nut and wedge.

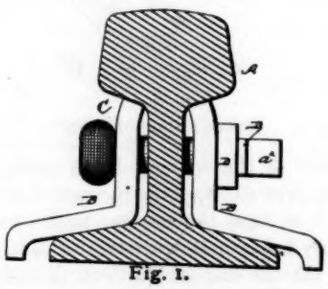

Fig. 1.

FLINDALL'S RAILROAD-RAIL JOINT.

A represents a railroad-rail of the usual form, and B B are the fish-plates on each side of the joint. Through the plates B, and the web of the rail A, are passed a series of bolts or pins C, headed on one end, as usual, but without screw-threads. The ends of these bolts are bent to one side, as at *a*, beyond the fish-plate, and formed with one side flattened, as at *a'*, and the extreme point is continued in a thin web a^2, as fully shown in Fig. 3. Upon the shank of the bolt is placed a nut or plate D, having its hole *d*, beveled outward on each side, as clearly shown in

Figs. 2 and 4, and a wedge-key D′, is driven into this nut, as represented. When the joint is formed, the bolts C, are passed through the rails and plates B, and the nuts D, placed on their bent or angular ends, this angular portion of the bolt just fitting the bevel upon one side of the nut. The wedge D′, is then slipped into the nut against

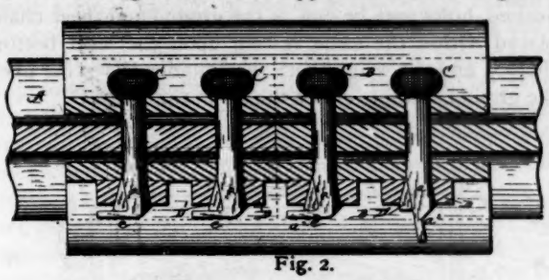

Fig. 2.

FLINDALL'S RAILROAD-RAIL JOINT.

the flattened side of the bolt, and the parts are tightened by a blow upon the wedge and head of the bolt at the same time. The thin point of the bolt is then bent down over the wedge, as at *e*, and the whole is secure against any possible loosening by the jar of passing trains or other accident. When the bolt is to be removed, the point is bent out and a side blow on the wedge then loosens the parts effectually. It is obvious that instead

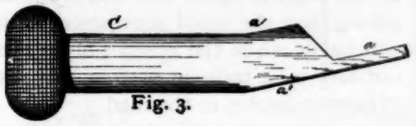

Fig. 3.

Fig. 4.

Fig. 5.

FLINDALL'S RAILROAD-RAIL JOINT.

of a nut upon each bolt, a bar may be used having beveled holes for all the bolts, exactly as described.

It is claimed for this form of rail-joint that it is simple, economical and reliable, thoroughly answering the purposes for which it is designed, and effects a large saving in smoothness of joint and close connection.

The device is controlled by the patentee, to whom all inquiries and communications should be addressed.

Moore's Car-Coupling.

WILLIAM HENRY MOORE, of Elsie, Mich., is the inventor of a new and improved form of car-coupling, which is herewith illustrated and described. The invention relates to that form of car-coupling adapted to automatic working under all conditions, combined with entire safety to those handling the device.

In the accompanying cuts, Fig. 1 is a sectional plan view of the improved car-coupling coupled; Fig. 2 is a similar view uncoupled; Fig. 3 is a cross-sectional view of the same on the line *x x*, Fig. 2.

The draw-head A, is provided in its outer end with the opening B, through which the link C, can be passed into the draw-head, and which leads into the cavity D, in the draw-head in the bottom of which cavity the recess E, is formed. In the cavity D, the coupling-hook F, is pivoted to swing vertically, the prong of the said hook being at the front end of the draw-head. The spring G, secured in the draw-head, rests on the hook F, and presses the same downward.

The shaft H, is journaled transversely in the draw-head, extends to the sides of the car, and is provided at the end with the handles I, and in the recess E, the cam J, is mounted on the said shaft, the cam being below the coupling-hook F. In the bottom of the opening B, the notch or recess L, is formed for receiving the end of the prong of the coupling-hook F.

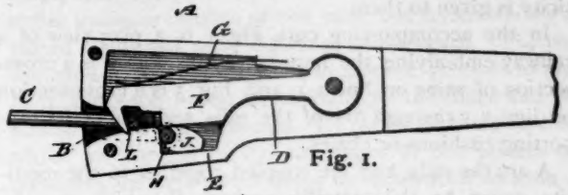

Fig. 1.

MOORE'S CAR-COUPLING.

When the cam J, is swung down, the cars can be coupled. The entering link C, strikes the beveled end of the coupling-hook F, and swings the same upward until the inner end of the said link has passed the prong of the coupling-hook, when said hook is forced down by the spring G, the prong of the hook passes through the link, and the link is thus coupled. To uncouple, the shaft H, is turned in such a manner as to swing the cam J, upward and cause it to raise the coupling-hook F. When the

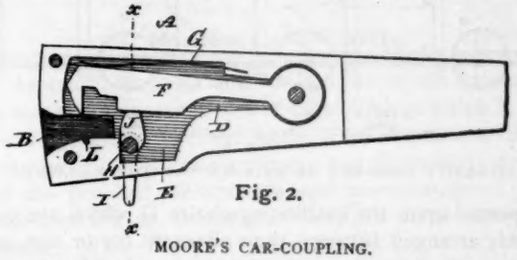

Fig. 2.

MOORE'S CAR-COUPLING.

draw-head is to be so adjusted that it cannot couple, the cam J, is swung up to hold the coupling-hook raised and prevent the spring from forcing it down. When the coupling-hook is lowered the end of its prong rests in the recess or notch L, thus preventing the link from sliding out under the prong of the hook.

It is claimed for this form of car-coupling that it is thoroughly automatic, reliable, simple and economical,

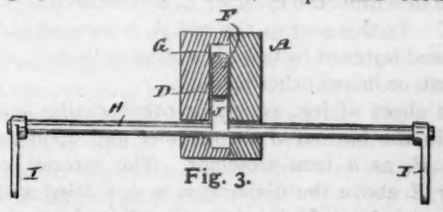

Fig. 3.

MOORE'S CAR-COUPLING.

and is readily attached to any form of car. It will work equally well on grades and curves, and is handled with great ease.

The invention is under the control of the inventor and Walter Scott Moore, also of Elsie, Mich., to whom an interest in the device has been assigned.

Holland's Road-Bed or Rail-Support for Railways.

ROBERT M. HOLLAND, of Philadelphia, Pa., is the inventor of a new and improved form of road-bed or rail-support for railways, which is herewith illustrated and described. The object of this invention is to provide suitable cushioning and supporting devices for rails of railways, dispensing with the usual sleepers, to the end that the cars traveling over such a road-bed may run more smoothly and with less jarring to the occupants of the train, and in carrying out the device the rails are connected by metallic ties, so as to insure their exact gauge, and support the said rails upon air-cushioning devices, whereby vertical elasticity is given to them.

In the accompanying cuts, Fig. 1 is a plan view of a railway embodying the improvements; Fig. 2 is a cross-section of same on line *x x*, and Fig. 3 is a cross-section on line *y y* through one of the rails and one of its supporting cushions or chairs.

A are the rails, and are coupled together to the requisite gauge by the metallic tie-bars B, which may be secured to the rails in any suitable manner, a simple construction being that shown, in which a U-shaped bolt C, is passed through holes *b*, in the bar, and the upper end *c*, bent down over the flange of the rail. These rails are

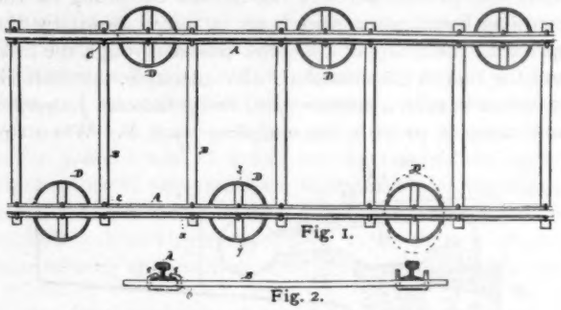

Fig. 1.

Fig. 2.

HOLLAND'S ROAD-BED OR RAIL-SUPPORT FOR RAILWAYS.

supported upon the cushioning-chairs D, which are preferably arranged between their alternate bar or ties, and under one rail are also preferably staggered with reference to those under the other rail. In construction these chairs are composed of a cylindrical casing E, having a flange or shoulder *e*, at the bottom, and into which the inverted, dished or dome-shaped diaphragm F, is placed, forming an air-space G, between it and the base H, upon which the chair rests.

I is a stirrup or rail-support, having its ends J, bent down to fit within the cylinder E, and secured therein by bolts K. To this stirrup the rail A, is secured and supported, and fastened by bolts L, similar to those C, already described, or in any other manner.

f is a sheet of felt, paper, or other similar material, placed in the bottom of the cylinder and upon the diaphragm F, as a frost-protector. The interior of the cylinder E, above the diaphragm is now filled with concrete or asphaltum M, so that the rail and its stirrup I, rests upon the floor of concrete, and the concrete is supported above a metallic diaphragm and an air-cushion beneath. The metallic portions may be galvanized, if desired, or the cylinder E, alone may be galvanized, to prevent the action of the elements upon the iron. These cylinders may be elliptical, as indicated in dotted lines D', Fig. 1, if desired, to obtain a greater area; but such changes are immaterial to the invention.

These cushioning-chairs are supported upon a level ground surface H, and the road may be ballasted with stone, which, surrounding cylinder E, retains the rails from lateral displacement and keeps them in line. If desired, holes may be dug in the ground and these chairs placed within the same, resting upon the level bottom thereof, and the weight with the cylinder E, resting upon the ground securely closes the air in the space G.

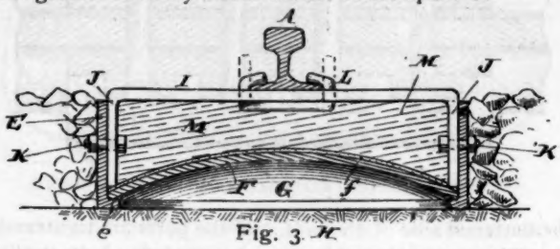

Fig. 3.

HOLLAND'S ROAD-BED OR RAIL-SUPPORT FOR RAILWAYS.

While the above described is the preferable form of construction, it need not be limited to the exact details thereof, which may be altered and modified as circumstances may require.

It is claimed for this form of construction that trains running at the highest speed will travel smoothly and without jarring, and the usual annoyance of noise and rattle be obviated; while the absence of oscillation and shaking ordinary to a train in motion, will result in a greatly increased economy to the road.

The device is under the sole control of the inventor, to whom all communications should be addressed.

Hackenberg's Oil-Cabinet.

JACOB A. HACKENBERG, of Kimberton, Pa., is the inventor of a new and improved form of oil-cabinet, which is herewith illustrated and described. This invention relates to improvements in oil-cabinets; and it consists in the combination of the cabinet, the pocket connected thereto and into which the oil from the measures is emptied, the measures, the rods for operating them, and a single faucet connected with the pocket, the top edge of the pocket having recesses formed in it, so as to correspond to the shape of the measures, and thus allow the measures to be tilted, so as to empty their contents into it. The object of the invention is to pivot the different measures below their centers between the pronged ends of the rods by means of which they are operated, so that when the measures are drawn up to the top of the cabinet they will automatically tilt and empty their contents into the pocket.

In the accompanying cuts, Figs. 1 and 2 are vertical longitudinal sections of an oil-cabinet embodying the invention.

A represents the tank, body, or cabinet in which the oil is placed for the purpose of being measured out from time to time. In order to cause the oil to settle upon that side of the bottom of the cabinet where the measures descend to be filled, there is placed in the bottom the partition B, which divides the bottom of the cabinet vertically to a greater height than the top of the largest measure,

and which partition has its top inclined downward, as shown. No oil enters that portion of the bottom which is inclosed by the partition, and hence all of the oil that remains in the cabinet after the supply has become somewhat exhausted flows down into the space C, where the measures descend to be filled. If this partition were not used, a large amount of the oil would always remain in the cabinet, and which could never be reached by any of the measures. The lid D, of this tank is hinged to the top, so that it can be raised to allow the oil to be poured into the tank, or for any other purpose; but the remaining portion of the top of the cabinet is preferably rigidly secured to the cabinet, and is curved upward, as shown, so as to allow the measures to be raised freely above the top of the pocket F, into which the measures empty their contents. The rear side of the pocket F, projects downward to the bottom of the cabinet, so as to form the vertical wall or surface R, against which the measures J, are held by the rods I, and which wall or surface serves as a guide to keep the measures in a vertical position until they

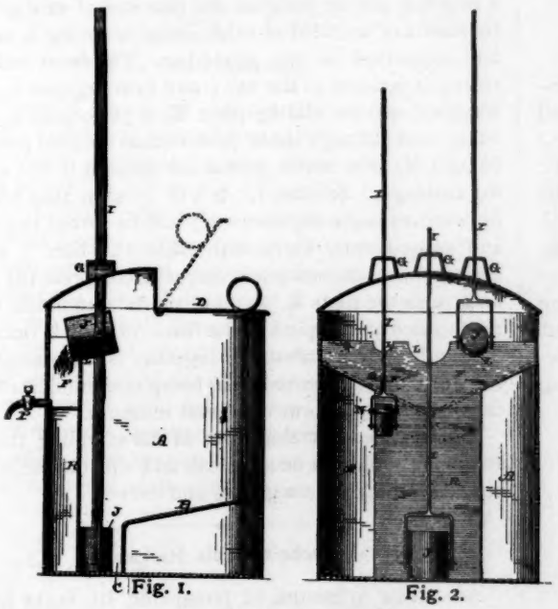

Fig. 1. Fig. 2.

HACKENBERG'S OIL-CABINET.

reach the top of the pocket. Upon the top of the stationary portion of the cover are suitable guides G, and in these guides and the top are formed openings through which the rods I, work up and down. Each one of these rods I, has its end made forked or pronged, and in between these pronged ends are pivoted, below their centers, the measures J, of different sizes. These measures are pivoted below and back of their centers, so that when they are raised upward they will freely tip forward, and thus discharge their contents in the pocket F. Each measure is retained in a vertical position between the pronged ends of its rod by bearing against either the side of the pocket when the pocket is formed inside of the cabinet, or against the side of the can when the pocket is formed outside. As long as the measures bear against the side of the pocket or the side of the can, they can neither tilt backward nor forward; but as soon as their upper portions rise slightly beyond their corresponding recesses L, in the top of the pocket the weight of the fluid causes the measures to tilt forward, and thus empty their contents into the pocket.

If so desired, in order to prevent the measures from tilting backward, a band N, may be attached to the prongs of each rod in the rear of each measure, so that when the measure is raised above the pocket it can only tip forward and empty into the pocket and not backward. This band is not absolutely necessary, and may be used or not, as may be desired. If desired, there may be also attached to each one of the rods a stop O, which will strike against the under side of the top of the cover, and thus prevent the measure from being raised higher than is necessary to empty into the pocket. The measure F, may be placed either inside or outside of the tank, but is here shown as placed inside as a mere matter of convenience. The rear top edge of this pocket has a number of recesses formed in it, and each recess corresponds to the shape and the size of one of the measures. By means of these recesses which are formed in the top edges of the pocket the measures are enabled to begin to tip forward as soon as their upper portions begin to rise above the pocket, and thus there is no danger of their tilting backward. To the bottom of this pocket is connected a faucet P, through which the oil which is emptied into the pocket can be drawn off at will.

It is claimed for this form of oil-cabinet that it is simple, useful and durable, and fully answers all the requirements appertaining to the purpose. All inquiries and communications should be addressed to the inventor, Jacob A. Hackenberg, Kimberton, Pa.

Moorman's Car-Coupling.

JAMES F. MOORMAN, of Ohio, Iowa, is the inventor of a new and improved form of car-coupling, which is herewith illustrated and described. This invention relates to improvements in car-couplings; and the novelty consists of the peculiar construction and combination of parts, substantially as hereinafter fully set forth and illustrated,

The object of the invention is to provide a car-coupling which shall automatically couple when the draw-heads thereof abut together, and which shall be easy and thoroughly effective in operation; to provide means whereby the shock and jar occasioned by the cars coming together shall be in a great measure taken up by the draw-heads, and prevented from being communicated to the car-body; to provide means whereby the draw-heads may be readily uncoupled and disconnected, and to combine simplicity with strength and durability of construction.

In the accompanying cuts, Fig. 1 is a perspective view of a car-coupling embodying the invention, showing the draw-heads thereof coupled together; Fig. 2 is a detail perspective view of one of the draw-heads, and Fig. 3 is a horizontal longitudinal section of one of the draw-heads on the line *x x* of Fig. 2.

A B, designate the draw-heads to be secured to the meeting ends of two railway-cars beneath and at the middle of the same and projecting beyond one end thereof. Each draw-head is cut away at its front end so as to provide a socket E, and two forwardly-projecting arms C D, which arms are arranged a distance apart at their rear

ends equal to the width, or a little more so, of the extreme outer end of the arm C, and thus forms the socket E, and the arm C, of one draw-head fits in the socket of the fellow draw-head. The arms C D, of each draw-head are arranged at opposite sides thereof, and the arm C, is of a greater length than the arm D, for the purpose above described. The inner vertical face of the arm C, has an inclined abutment *c*, and the similar face of the arm D, is rounded or curved, as shown at *d*, the inclined and rounded faces of the arms serving to guide the arms C, of the adjacent or fellow draw-head into the socket E, to connect said draw-heads together. The coupling-arms C, of each draw-head are chambered out, as at *e*, in Fig. 3, and the inner vertical faces of the arms are slotted, as at *e'*, which opens into the chamber *e*.

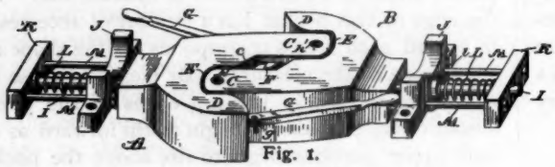

Fig. 1.

MOORMAN'S CAR-COUPLING.

F designates the coupling-hooks, arranged in the chamber *e*, and pivoted therein at its rear end, as at *f*, and having its hook-shaped end *f'*, normally pressed or forced outwardly through the slot *e'*, by means of a spring F', also arranged in the chamber *e*, as shown in Fig. 3. The front vertical faces of the hook-shaped ends of the coupling-hooks *f'*, are rounded or beveled, and when the draw-heads come or abut together for coupling, the beveled or rounded faces of the coupling-hooks thereof impinge against each other, to force said hooks rearwardly against the tension of the pressure-springs to effect the engagement of the coupling-hooks, and consequently coupling

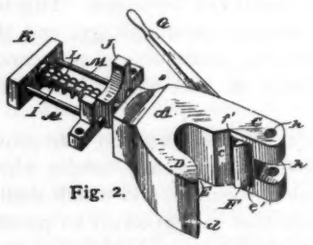

Fig. 2.

MOORMAN'S CAR COUPLING.

the cars together. The inclined and rounded faces of the arms of each draw-head serve as guides to the arm C, in entering the socket E, thereof, and the arms D, prevent lateral play of the draw-heads when the cars are in motion, so as to prevent them from becoming uncoupled. The cars are automatically coupled and the necessary play of the draw-heads permitted in rounding curves or other portions of the track which are out of a straight line.

G designates levers for uncoupling the cars, the said levers being secured to a pin or bolt *g*, which passes through the draw-head and is secured to the coupling-hook F. The front vertical face of the arm C, may be recessed, as at *h*, for the reception of a coupling-link when it is desired or becomes necessary to use a pin-and-link coupling, said arm C, being further provided with vertical perforations or passages *h'*, for the reception of the coupling-pin to engage the link fitted in the recess *h*. The rear end of each draw-head is provided with a guide-bar or rod I, which is rigidly secured thereto and passes through an opening in a bracket or supporting-casting J, which is securely bolted or otherwise rigidly fastened to the car-body or platform.

K designates a sliding plate arranged to move on the bar or rod I, longitudinally thereof at its rear end, and this plate is normally pressed or forced rearwardly against

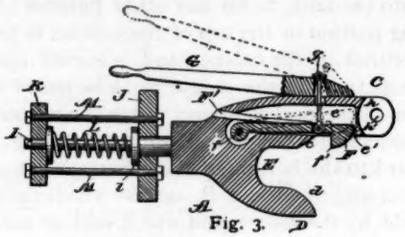

Fig. 3.

MOORMAN'S CAR-COUPLING.

a stop lug, pin, or plate on the rear end of said guide-bar by means of a coiled or other suitable spring L, arranged and supported on the guide-bar. The front end of the spring is secured to the bar I, and bears against a plate or washer *l*, and the sliding-plate K, is perforated at its side edges, and through these perforations headed guide-pins or rods M, pass, which guides are secured in the supporting casting or bracket J. It will be seen that when the draw-heads come together they will be forced rearwardly, and consequently carry with them the bars I, and the springs L, which movement serves to compress the springs and cause the plate K, to move or slide upon the bar and the headed guide-pins. The force or shock occasioned by the draw-heads abutting together is thus taken up by the same, and prevented from being communicated to the car-body and platform in a great measure.

It is claimed for this form of car-coupling that it is simple, durable and economical, and will couple at different elevations, and on grades and curves.

Shobe's Cable Railway.

ABRAHAM A. SHOBE, of Jerseyville, Ill., is the inventor of a new form of cable railway, the construction and operation of which is herewith illustrated and described. The invention relates to an improvement in cable railways, and it consists, essentially, in providing for the cable a

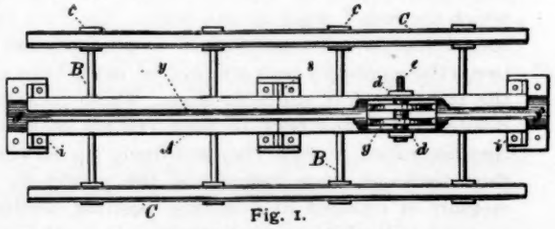

Fig. 1.

SHOBE'S CABLE RAILWAY.

tube or tunnel which may be employed either with an ordinary double-rail track, or with a triple-rail track, of which the central rail is adapted to carry the main weight of the cars, the tube or tunnel being so constructed that it may be used for either of the above-named types of

railway without requiring any alteration in the form or dimensions of the several parts of which it is composed; and, further, that it shall constitute the main support for the cross-ties, to the extremities of which are secured the chairs upon which rest the two outer rails, so as to secure the whole rigidly together in one structure sustained mainly upon columns or supports located at suitable intervals centrally throughout the entire length of the road-bed.

In the accompanying cuts, Fig. 1 is a plan view of the device without the central rail; Fig. 2 a side elevational view of the same; Fig. 3 a transverse sectional view taken in the line *x x* in Fig. 2, showing one of the cross-ties, to

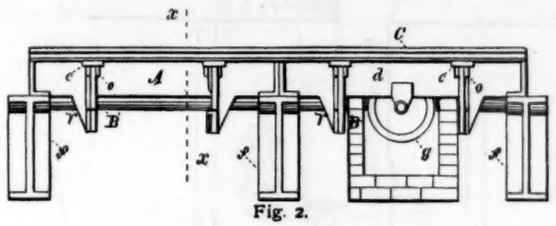

Fig. 2.

SHOBE'S CABLE RAILWAY.

the extremities of which are secured chairs surmounted by the rails; and Fig. 4 a transverse sectional view of the cable-tube shown in connection with the central rail, and also taken in the line *x x* in Fig. 2, and Fig. 5 a perspective view of the rails, cable-tube and drain-pipe.

A represents a cable tube or tunnel divided longitudinally into two separate and strictly similar parts, entirely distinct from each other (fully shown in the plan view in Fig. 1,) and provided with flanges *i*, by which the tube is secured to the tops of central supports *f*, designed to reach below the surface of the road-bed sufficiently far to secure a permanently solid foundation. The sections of the tube are secured together, end to end, preferably by flanges S, adapted to receive bolts or rivets. To the under side of each half of the tube are secured knee-plates

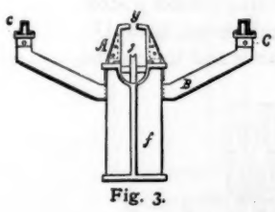

Fig. 3.

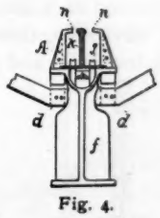

Fig. 4.

SHOBE'S CABLE RAILWAY.

r, (shown in Fig. 2,) to which are bolted cross-ties B, the outer ends of which are bent into a vertical position, so as to support at a proper elevation chairs *c*, each of which is provided with a downward-projecting flange *o*, by which it is secured to the cross-tie. The tops of the chairs are preferably made flat, as shown, and are intended to rest on the surface of the road-bed, the upper surface being designed to receive any ordinary form of rail secured in position by any of the means usually employed for that purpose.

At suitable distances apart throughout the length of the tube are cable-carriers *g*, adapted to revolve upon fixed spindles *e*, supported by hangers *d*, secured to the sides of the tube, as shown in Fig. 2. To adapt the tube for the reception of a deep central rail *k*, secured to the central supports *f*, by bolts, rivets, or other suitable fastenings, the two halves are removed laterally upon the central supports to such position that they stand at such a distance apart as the base of the rail may require for its admission between them, or as may be necessary to leave an opening *n*, shown in Fig. 4, between each side of the head of the rail and the tube, to admit the arm of an ordinary cable-grip, which, when the center rail is not employed, passes down into the tube through the opening *y*, as shown in Figs. 1 and 3.

It will be observed that each central support is provided with a semicircular cavity in the top, for the reception of similarly formed gutters, the office of which is, to convey the water, which in rainy seasons flows into the cable-tube, into the pits provided for the cable-carriers, as shown at B in Fig. 2, whence it may be conducted by drain-pipes to wherever most conveniently disposed of. In order to adapt the spindles *e*, upon which the cable-

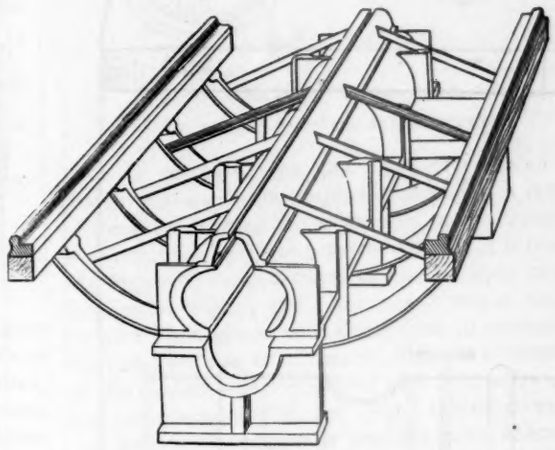

Fig 5.

SHOBE'S CABLE RAILWAY.

carriers revolve, to the triple as well as to the double rail track, they are made long enough to reach through both hangers when the two halves of the tube are separated to the widest extent, one end being rigidly secured in the eye of one hanger, and the other free to slide longitudinally through the eye of the opposite one, as shown in Fig. 1.

In regard to the cross-ties, it will be observed that they are each provided, as shown at *h* in Fig. 3, with bolt-holes adapted to both positions of the two halves of the tube, the two inner holes to be used when the two halves of the tube are in the position shown in Fig. 3, and the two outer ones when in the position shown in Fig. 4. For the operation of branch roads a third, or, if necessary, a fourth, cable-carrier may be interposed between the two as shown in the cuts.

It is claimed by the inventor that this form of cable railway effects all desirable ends, and the material being wholly metal is, if properly prepared, practically indestructible; extensive excavation is not required, and the absence of bolts, spikes, etc., renders its construction simple and economical.

Harrison's Platform-Gate for Railway-Cars.

JAMES P. HARRISON, of Danville, Va., is the inventor of a new and improved form of platform-gate, the construction and operation of which is herewith illustrated and described. The object of the invention is to provide means whereby the exit and entry openings of railway and other cars may be controlled throughout a train by the engineer or other selected train-hand, so that no danger can arise by passengers being tempted to leave or board a moving train, the entrances to the cars being closed throughout the train at the moment of starting, and consists in a system or series of movable or swinging gates attached to the exit and entry openings of railway and other cars in combination with connecting devices throughout the train whereby the gates to the cars of the entire train will be simultaneously closed or opened from one specified point by one train-hand, preferably the engineer.

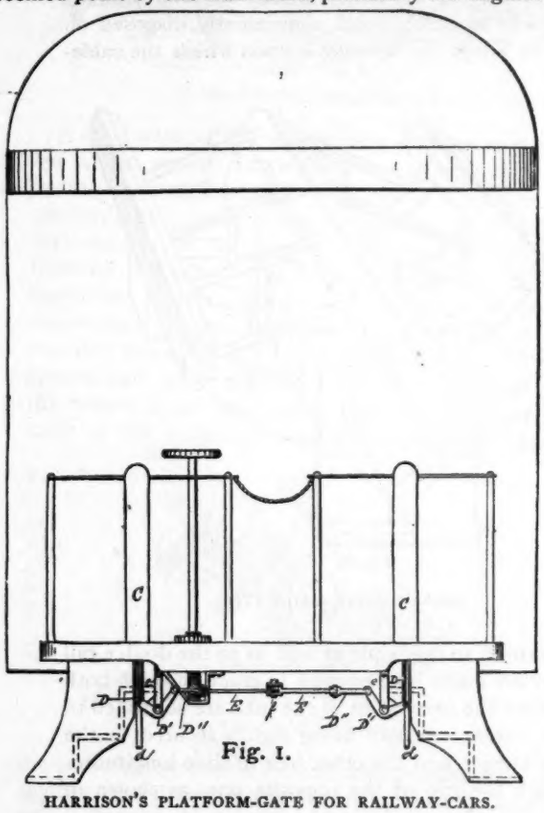

Fig. 1.

HARRISON'S PLATFORM-GATE FOR RAILWAY-CARS.

In the accompanying cuts, Fig. 1 is a view of an end of a car with the invention attached; Fig. 2 is a side elevation of the end of a car, showing the platform-gate closed; Fig. 3 is a side elevation of the end of a car, showing the platform-gate opened; Fig. 4 is a front elevation of the hollow post and gate-bars closed down; Fig. 5 is a front elevation of the sustaining and locking-bar to secure the free end of the gate-bars and a section thereof on line *y y*, and Fig. 6 a bottom plan view of the car and devices for operating the gate-bars and locks, the brakes being on and the gates open.

A is the bed or frame of the car, and B the platform. From the outer edge of the platform on each side there is removed one of the ordinary stanchions used to support the hand-rail, and in their places are set or bolted to the platform hollow posts C, provided with a slot *a*, on the side next to the car-body and slotted lumps or projections *a'*, forming bearings for pivots *b*, on which swing vertically-moving bars *d d*, which constitute the gate proper. Integral with the bars *d*, and projecting beyond the pivots *b*, are short crank-levers *b'*, to the rear ends of which, at *d d' d''*, is pivoted a vertical pull-bar D, the lower end of which is pivoted to one arm of a bell-crank D', swung in a hanger *e*, secured beneath the platform. The inner

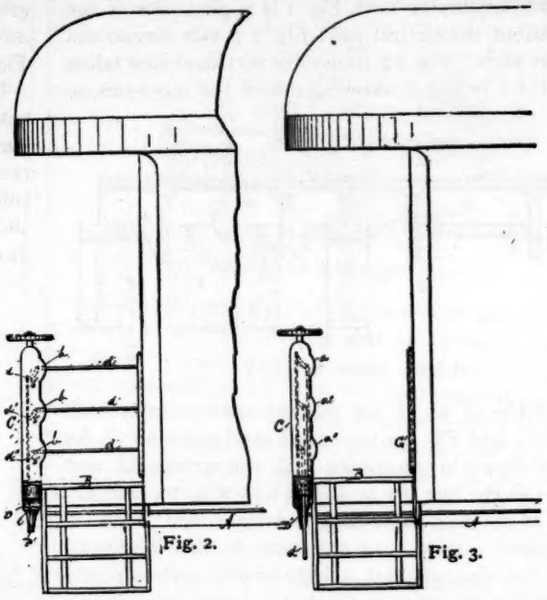

Fig. 2. Fig. 3.

HARRISON'S PLATFORM-GATE FOR RAILWAY-CARS.

ends of the inner arms of bell-crank levers D', are pivoted to sliding bars D'', moving in eyes or hangers beneath the platform, and in turn these bars D'', are pivoted to the arms E E, of a toggle-lever, having a central pivot *f*, to which is secured an operating bar or rod F, passing to the piston-rod of the air-cylinder of the automatic brake, in this instance, for illustration, the Eames air-brake. The rod F, is moved back and forth by the air-cylinder piston, and this, obviously, through the toggle-lever, bars D'', bell-crank levers D', and pull-bar D, raises and lowers the

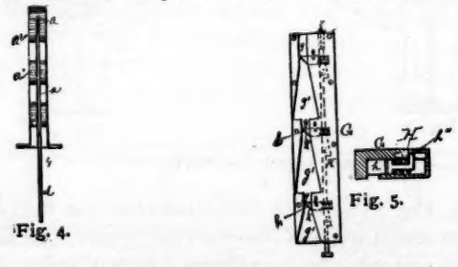

Fig. 4. Fig. 5.

HARRISON'S PLATFORM-GATE FOR RAILWAY-CARS.

bars *d*, so as to alternately close and open the entrances to the platform, as shown in Figs. 2 and 3. When the bars *d*, are raised across the platform, it is necessary to secure their free ends and give stability to the gate while the brakes are off. This is accomplished by means of a slotted casting G, secured to the exterior of the wall of the car in line opposite the movement of the bars *d*. For fear that the free ends of the bars may be deflected from entering the holding-slot *g*, sections of the slot *g'*, are flared, as

shown, so as to guide the end of the bar into slot *g*, as the arc of the movement of the free end of the bar approaches termination. The ends of the bars then pass over spring-bolts *h*, having beveled faces *h'*, and lugs *h''*, behind which moves an unlocking-bar H, which slides in ways in casting G, and is provided with a series of wedged-shaped sections *i i*, lying behind lugs *h''*, so that an upward movement of the bar H, will cause the bolts to recede and liberate the ends of bars *d*. The unlocking-bar is caused to move upward by means of a wire rope or cord *i'*, which passes over a sheave *j*, and down over another sheave *j'*, to the lever attached to the air-cylinder piston-rod. In the lengths of the wires or cords *i'*, at some point are interposed springs *k*, to give the operation of the cords a yielding or elastic movement.

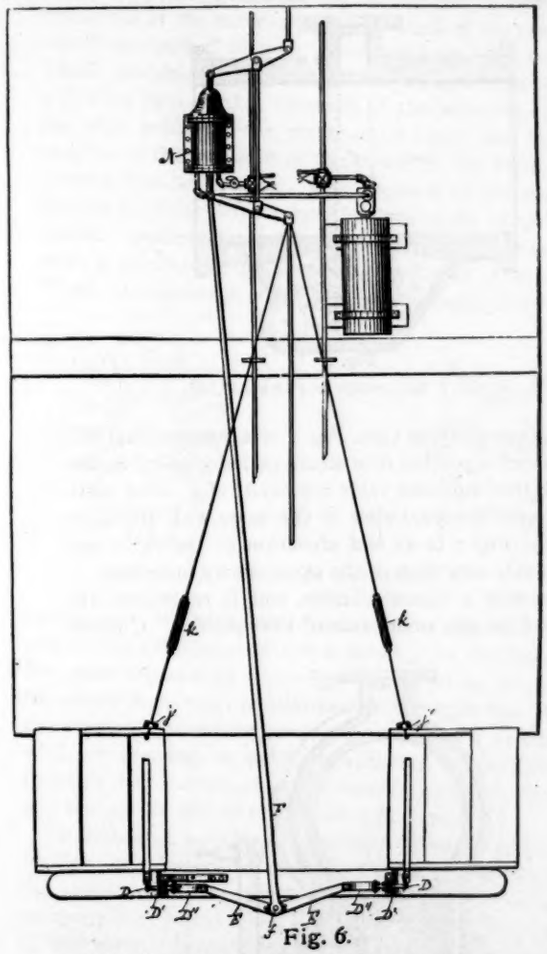

Fig. 6.

HARRISON'S PLATFORM-GATE FOR RAILWAY-CARS.

Among the merits claimed for the device is that when in motion the train is freely open for passage from end to end, as the application of the gate renders falling from the platform impossible, while it also is impossible for trespassers to board the cars except under the eye of the crew. The conductor and brakemen are provided with keys which enable them to unlock a special gate, as may be required.

The device is specially adapted to most southern roads where access to trains is generally free to all, and would be an effectual prevention of the many accidents resulting from the frequent attempts to board or leave moving trains.

Davis's Electric-Alarm Clock.

GEORGE H. DAVIS, of Washington, D. C., is the inventor of a new and improved form of electric-alarm clock, the construction and operation of which is herewith illustrated and described. This invention relates to that class of alarm-clocks that actuate electric signals at predetermined times, and has for its objects to provide easy adjustment of the contacts by means of which the circuit is completed and the signal operated; to provid emeans for regulating the length of circuit-contact; to provide means whereby the signal can be operated at predetermined unequal intervals, or at intervals of greater length than twelve hours, and to provide a simple and inexpensive construction for accomplishing the objects herein set forth.

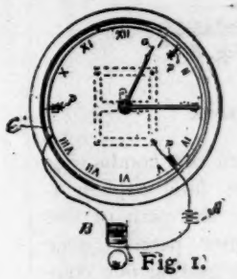

Fig. 1.

Fig. 2

DAVIS'S ELECTRIC-ALARM CLOCK.

In the accompanying cuts, Fig. 1 is a view of a clock-dial provided with the improvements; Fig. 2 is a section of the same showing the adjustment of the clock-pointers with reference to the improvements; Fig. 3 is one form of the improved contact-wheel to be used upon clocks with large dials; Figs. 4 and 7 are other forms of the same to be used upon clocks with small dials in connection with the improved rim attachments; Fig. 5 is a detached view of the contact-wheel provided with alternate conducting and non-conducting blades. Fig. 6 is a detail view showing the circuit-breaker in position with contact-wheel, and Fig. 8 shows one of various forms which has for its object the completion of the circuit without passing it through the hands and works. In this form the pivot-

Fig. 3.

Fig. 4.

DAVIS'S ELECTRIC-ALARM CLOCK.

needle, in passing over an insulated plane, comes in momentary contact with a conducting surface, thus completing the circuit between this point and the frame.

Emanating from the battery A, are two conductors, one of which is connected with the frame-work of the clock mechanism or "works," the other, after passing through the electro-magnets B, to the rim C, upon the clock-face. Under this rim C, is inserted a sharpened end *d'*, of the frame of the contact-wheel D, being held firmly in position by the pressure of the rim upon the dial. The contact-wheel, as shown in Fig. 3, is pivoted upon its axis between sockets formed in the frame *d'*, and the spring d^3, which latter presses upon and regulates its movement. The contact-wheel, as shown in Fig. 4, is pivoted on its axis between sockets in the rim E, and the spring F. The

rim E, is fastened to the dial by small screws, the outer edge being flared, as shown in the cuts, and provided with small depressions for the reception of wheel D. Rim E, is only used where the clock is not provided with a conducting-rim, as C, and is of the shape shown in Fig. 4. The spring F, is formed so as to extend under the flared portion of the rim E, and over the pivot of the wheel D, forming a small socket for the same, the pressure or strain of said spring on the under side of flared part of the rim and pivot of wheel D, retaining it in position. The contact-wheel D, is provided with six blades, each alternate one being composed of conducting material and the remainder of non-conducting material. This may be altered at will. It may be desired to have an alarm only once in thirty-six hours, in which case there would

Fig. 5.

Fig. 6.

DAVIS'S ELECTRIC-ALARM CLOCK.

be two non-conducting blades between the conducting blades, as will be hereinafter more fully explained. The contact-wheels D, are placed in the path of the hour-pointer only, the minute-pointer passing over them, as shown in Fig. 2, in this way getting one contact only in twelve hours. So if an alarm were desired every thirty-six hours only, two non-conducting blades would be placed between conducting-blades, the hour-pointer making thus three revo utions of the dial between alarms. On the end of the hour-pointer is a small insulator-cap G, of the form shown in the cuts, the attachment being adjusted in proper position by the flexible side-clamps, which extend under and around the hand. The dial of the clock is insulated from the mechanism or works. A circuit is completed when the hour-pointer comes in contact with a conducting-blade of the wheel D, the hour-pointer being connec ed with the mechanism,

Fig. 7.

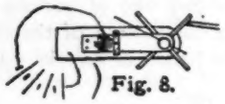

Fig. 8.

DAVIS'S ELECTRIC-ALARM CLOCK.

and the wheel D, with the rim. The circuit being closed the alarm is operated until the circuit is broken by the insulator-cap G, coming in contact with the blade. In passing this blade it will be observed that the pointer has placed one of the non-conducting blades in its path. When the pointer again reaches the wheel D, it will come in con!act with and move in passing the non-conducting blades the same as it did the conducting-blades, placing in position another blade, conductor, or non-conductor, as the case may be. So on, each revolution of the pointer passing one of the blades of the wheel D, and placing another in position in its path. The contact-wheels D, may be placed at will around the rim C, using one or more, and any form of wheels, as desired, so that one day the alarm may be operated at one hour and another day at a different hour, if so desired. When it is desired not to use the alarm, the wheels D, are removed.

It is claimed for this form of alarm-clock that it is thoroughly effective in its purpose, and while complete in all its parts, is simple and economical of construction, and is not liable to become disordered.

Carll's Balanced Rocker-Valve.

ADDISON B. CARLL, of Bradford, Penn., is the inventor of a new and improved form of balanced rocker-valve, which is herewith illustrated and described.

This invention relates to an improvement in balanced oscillating valves for steam-engines; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out.

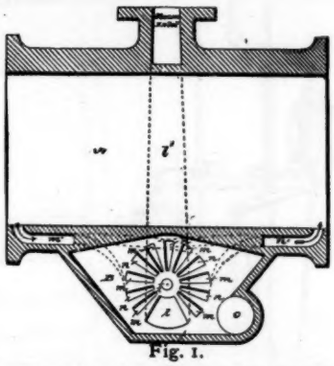

Fig. 1.

CARLL'S BALANCED ROCKER-VALVE.

In the accompanying cuts, Fig. 1 is a longitudinal sectional view of a portion of a steam-cylinder and a steam-chest with the improved valve removed; Fig. 2 is a vertical transverse sectional view of the same with the valve in position; Fig. 3 is an end elevation of the valve, and Fig. 4 is a side elevation of the same, partly in section.

A represents a steam-cylinder, and B represents the steam-chest on the under side of the cylinder. C repre-

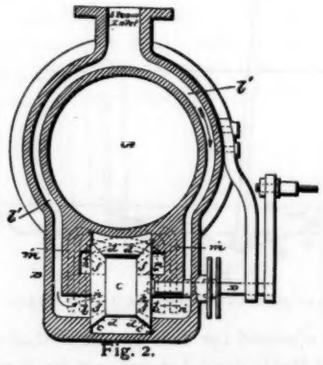

Fig. 2.

CARLL'S BALANCED ROCKER-VALVE.

sents a hollow cylindrical valve, which is formed of two sections *c c'*, fitted together and extensible telescopically, one of the said sections having inwardly projecting pins *a*, that enter and work in grooves or slots *b*, made in the other section. The ends of the valve are flanged, as at *d*, and beveled on their inner sides. The ends of the valve have the inlet-openings *e*, and the radial openings *f*, that communicate with the interior of the valve, and radial

notches *g*, are cut through the flanges on the ends of the valve between the openings *f*.

The valve is journaled in the steam-chest by means of trunnions *h*, on the ends of the valve, and recesses *i*, in the side walls of the steam-chest to receive them. The side walls of the steam chest also have ports *l*, that correspond with the openings *e*, of the valve, and the series of alternately-arranged radial ports *m* and *n*. The ports *m*, communicate with a channel *m'*, that leads to one end of the cylinder and the ports *n*, communicate with a channel *n'*, that leads to the other end of the cylinder. The ports *l*, communicate with channel *l'*, in the sides of the cylinder through which steam is admitted, and the steam-chest has an exhaust-port, one or more, *o*.

A valve-stem D, is socketed at one end to one of the trunnions of the valve, and has a crank at its outer end, which is attached by a rod to an ordinary eccentric, with which the engine is provided, in the usual manner It will thus be seen that the ends of the valve bear against the side walls of the steam-chest and are balanced therein by the pressure of the steam in the valve, which reduces friction thereon. The pressure of the steam on the inside of the valve keeps the ends of the valve tightly pressed against the side walls of the steam-chest. The valve is oscillated slightly when the engine is in motion. When the openings *f*, in the valves register with the

Fig. 3.

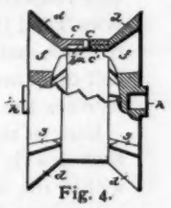

Fig. 4.

CARLL'S BALANCED ROCKER-VALVE.

openings *m*, in the steam-chest, steam is admitted to one end of the cylinder, and the notches *g*, in the flanges of the valve register with the openings *n*, so as to exhaust the steam from the opposite end of the cylinder. When the valve is turned to cause the openings *f*, to register with the openings *n*, steam is admitted to the cylinder through the channels *n'*, and exhausted from the opposite end thereof, as will be very readily understood.

By this construction of the valve it is only necessary to oscillate the latter very slightly, thus reducing wear on the valve and valve-seat to a minimum, and effecting an economy in repairs for the engine by lengthening the life of the valve. In constructing this form of valve there should be one more of the ports, marked *n*, in Fig. 1, as the port *e*, of the valve is to cover the port *l*, and one of the ports *m* or *n*, according to which end of the cylinder is taking steam. It would also be preferable in place of the short trunnions *h*, in Fig. 4, to have the valve-stem run clear through the valve, and rest in a recess in the left wall of the valve-chest.

It is claimed for this device that, being a rocker-valve, it would be best placed underneath the cylinder, consequently avoiding accumulations of water, and, being balanced, it works with great ease and little friction. It is simple, durable and effective, giving a very true motion, and can be economically constructed.

Loehner's Railway-Track Drill.

AUGUST LOEHNER, of St. Louis, Mo., is the inventor of a new form of railway-track drill, which is herewith illustrated and described. This invention relates to railway-track drills; and it consists in certain improvements in the construction of the same, as hereinafter described.

In the accompanying cuts, Fig. 1 represents a plan view of a track-drill provided with the improvement; Fig. 2 is a side view of the same, and Fig. 3 is a view of the drill-holding device detached.

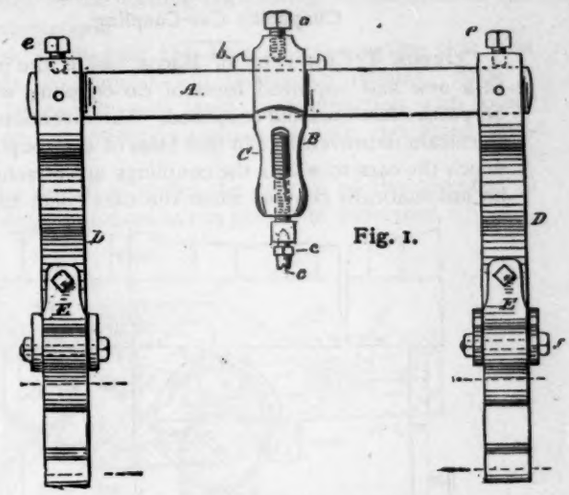

Fig. 1.

LOEHNER'S RAILWAY-TRACK DRILL.

A designates the top-bar, on which is placed the screw-housing B, which may be moved along the bar in either direction, and may be set opposite to any point where a hole is to be drilled in the track-rail, to which the device is applied and secured. The housing B, is secured fast to the bar by means of a screw *a*, which bears against a key *b*, which slides along the bar with the housing and prevents the screw from indenting the bar, so the latter is kept smooth. A screw C, is placed within and carried by the housing, the head of the screw being downward, and

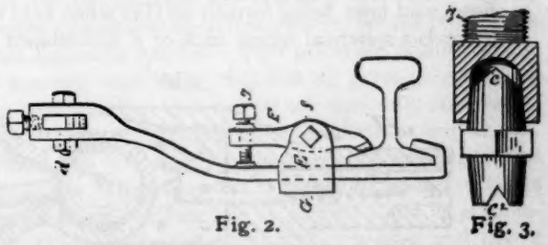

Fig. 2.

Fig. 3.

LOEHNER'S RAILWAY-TRACK DRILL.

having a socket in which is placed a double cone *c*, one having an angular point *c'*, and the other an angular notch or recess c^2, so that it may connect with any drill, either pointed or grooved.

D ind cates the hook-arms to connect with the rail to be bored, the said arms being secured to bar A, by means of bolts *d*. The screws *e*, are for the purpose of securing the arms D, to bar A, at any points desired, it being necessary sometimes to bring the arms near each other, as when drilling a hole near the end of one rail when no rail has been laid adjoining it.

E designates a clamping device, one being placed on each hook-arm to secure it firmly to the rail, said clamp being in the form of a lever or pivoted dog F, and a seat G, to which it is held by bolt *f*. A screw *g*, passes through the lever F, and being driven against arm D, closes the toothed dog tightly against the base of the rail and holds the frame firmly thereto.

It is claimed for this form of track-drill that it is simple, durable and economical, and perfectly adapted to effect the purpose of its invention.

Chappell's Car-Coupling.

CLIFTON T. CHAPPELL, of Macon, Ga., is the inventor of a new and improved form of car-coupling, which is herewith illustrated and described. The invention relates to certain improvements in that class of car-couplings by which the cars to which the couplings are attached may be automatically coupled when the cars come together,

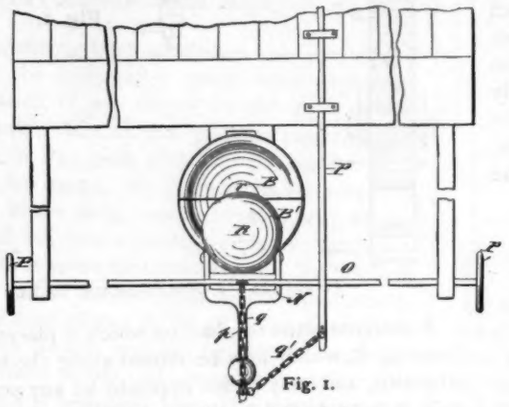

Fig. 1.

CHAPPELL'S CAR-COUPLING.

the coupling being so arranged that the cars may be uncoupled without entering the space between them, and its object is to simplify the construction of the coupling-pieces, and at the same time to render them efficient in operation; and to this end the invention consists of a pair of coupling-jaws pivotally connected to a draw-head, said jaws being formed so that when held together there is a spherical recess back of a bell-shaped mouth-piece, the jaws being held together by a locking-dog, which is retracted at the time of coupling or uncoupling, but which after the cars are coupled is held between the heels of the coupling-pieces by a spiral-spring.

In the accompanying cuts, Fig. 1 is a view of a portion of one end of an ordinary form of freight or box-car with the improved coupling applied thereto; Fig. 2 is a view of the side of the draw-head and coupling removed from the car; Fig. 3 is a view in vertical cross-section taken on line *x x* of Fig 2; Fig. 4 is a view of the connecting-link between the locking-dog and the operating-lever; Fig. 5 is a longitudinal vertical sectional view of two of the couplings, the parts being represented in the positions they assume as the cars are approaching, and the ball of the coupling-link has just struck upon the jaw of the coupling; and Fig. 6 is a similar view representing the parts as they appear after the cars have approached still closer.

A represents the draw-bar, formed with an enlarged head A′, in which there is a recess *a*, said recess being rectangular at its inner end, but being formed with beveled sides as it approaches the mouth of the head. Within

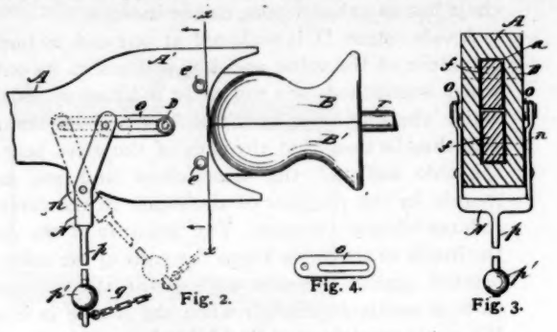

Fig. 2. Fig. 4. Fig. 3.

CHAPPELL'S CAR-COUPLING.

this recess *a*, there are pivotally mounted two coupling-jaws B and B′, each jaw being formed with a hemispherical recess *b*, and a flaring mouth-piece in the shape of one-half of an ordinary form of bell, there being a shoulder *c*, between the parts, as clearly shown in Figs. 5 and 6.

Back of the hemispherical portion of the coupling-jaws each jaw is provided with a lug or heel *f*, which fits within the rectangular portion of the recess *a*, the jaws being held in place by pivot-pins or bolts *e e*, and each heel *f*, being formed with a notch, so that when the two jaws are in the position shown on the left in Figs. 5 and 6 there will be a space or recess *i*, between the heels, which may be entered by a locking-dog C.

In order that the jaws may be free to swing upon their pivoted connection with the draw-head to the position shown on the right in Fig. 6, each heel *f*, is beveled off at *g*, and in order that the locking-dog may not strike

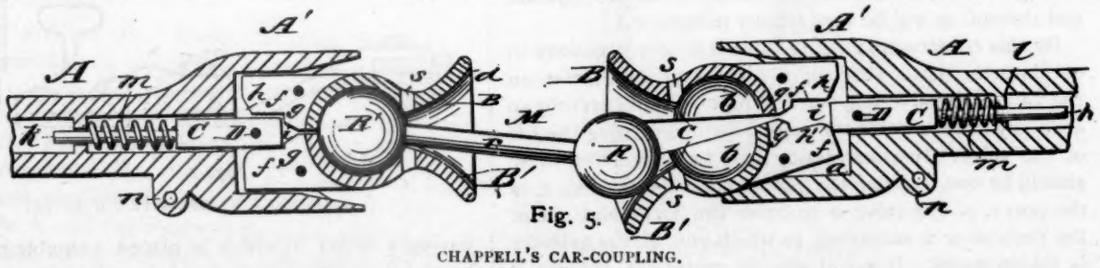

Fig. 5.

CHAPPELL'S CAR-COUPLING.

against a sharp projection or shoulder when being forced forward into the recess between the heels, the heel of the jaw B, is beveled, as shown at *h*, while the heel of the jaw B′, is rounded off at *h′*, this construction being clearly shown in the figures last referred to.

The locking-dog C, is provided with a shank *k*, which runs through an aperture formed in a partition *l*, of the draw-bar A, the dog being held forward and within the recess *i*, by means of the spiral spring *m*. In order that

the locking-dog may be withdrawn from its normal position in the socket *i*, such mechanism is provided as is best illustrated in the first four figures of the cuts. The dog C, is provided with a cross-bar D, which extends through slots formed through each side of the draw-head. Just at the point where the draw-head A′, branches out from the draw-bar A, there is a lug *n*, and to this lug there is pivoted a U-shaped lever N, which projects forward from its pivotal connection with the lug *n*, and is connected to each end of the bar D, by links *o*. From the center of the U-shaped portion of the lever N, there extends an arm *p*, which is provided with a weight *p′*, and the lower end of this arm *p*, is connected by a chain *q*, to a shaft O, which extends across the end of the car, each end of the shaft being provided with a hand-wheel, as P. A second chain *q′*, extends from the end of the arm *p*, to the lower end of a vertical shaft P′, which is secured in bearings fixed to the end of the car and extends upward slightly above the car-roof.

to the position shown in dotted lines in Fig 2, thus withdrawing the dog C, from the recess *i*, and leaving the jaws B B′, free to swing upon their pivoted connections *e*. In order that cars provided with this coupling may be coupled with cars provided with the old form of pin-and-link coupling, each of the jaws B B′, is provided with an aperture, as *s*, through which the coupling-pin may be inserted, a coupling-link of the ordinary construction being used at this time.

The balls R R′, will have all necessary play within the recesses of the locking-jaws, owing to the form of the mouth-pieces *d*.

It is claimed for this form of car-coupling that it is simple, economical, and thoroughly reliable; while it can be equally well used in conjunction with other patents or ordinary couplings as with cars fitted similarly.

The device is under the control of the inventor, to whom all communications should be addressed.

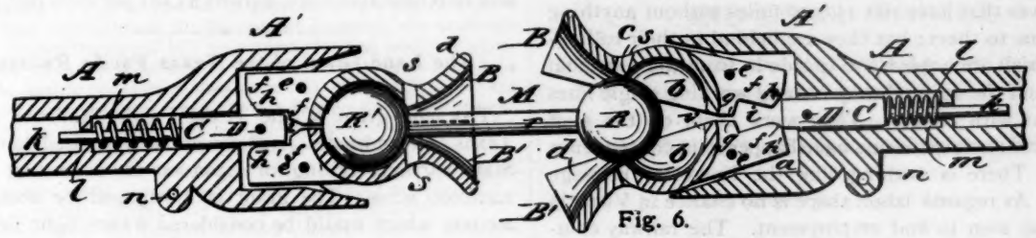

Fig. 6.

CHAPPELL'S CAR-COUPLING.

The coupling-link M, used with such a coupling as has been described, consists of a shank *r*, upon each end of which there is a ball R, so proportioned as to fit snugly within the spherical recess formed by the recesses *b b*.

The operation of this coupling is as follows: The coupling-link M, having been inserted between the jaws B B′, of one of the cars to be coupled, and the locking-dog C, having been advanced within the recess *i*, so as to prevent the jaws from swinging upon their pivotal connection, the cars to be coupled are brought together, and as they approach the extending ball R, of the coupling-link M, will strike against the bell-shaped mouth *d*, of the lower jaw B′, of the car, to which the first car named is to be coupled, because, as will be well understood, the force of gravity will draw the coupling-link M, to substantially the position shown in Fig. 5. As the cars continue to approach the ball R, will slide up the bell-shaped mouthpiece until the coupling-link and the opening jaws will be about in the position shown in Fig. 6, when anv continued approach to the cars will cause the ball to enter the recesses *b b*, after which the jaw B, will drop down so that its lower edge will be about in a horizontal plane, and the lower jaw B′, will be raised when the ball R, strikes against its inner rear face . When the parts are in this position, the spring *m*, will act to force the locking-dog C, forward within the recess *i*, thereby locking the jaws and preventing them from spreading to release the ball R. When it is desirable to uncouple the cars, either the shaft O, or the shaft P, will be rotated to wind up the chains *q q′*, which winding of the chains will move the lever N,

Patented Articles.

IT would seem to be a mistaken policy to rate patented articles at what are sometimes prohibitive prices, and much of the opposition which has been developed of late years toward patents arises from the unreasonable prices asked for the goods themselves. We were recently shown a certain article of household use which is a necessity. The cost to manufacture it could not exceed one dollar, for the material was common and there was no skilled workmanship upon it anywhere, yet the retail price of this apparatus was $10. Such prices are prohibitive for two reasons: one being that not all persons can afford them, and another, that buyers are generally able to tell whether they are getting value for their money or not, and estimate very closely between cost of production and retail price. The argument of the seller seems to be, in some cases, that the article is patented and he is therefore entitled to demand whatever he chooses, and that it is a sufficient answer to any objection that it *is* patented, and cannot be had unless the sum demanded is received. This seems to us to be a wholly erroneous position, and the reply should be that, inasmuch as a given article is patented the maker is ostensibly protected, and can therefore rely upon his rights to vend for the life of the patent. Moreover, commercial considerations should convince retailers of patented devices that popular prices sell more goods than unpopular prices. There is really no reason why patented articles should sell for any higher price than those not patented. The public does not buy them for the patent mark, but for their utility, and if the goods

are what is claimed for them the buyer attains his end more rapidly with popular prices than with high prices.

Instances are not wanting where the sale of really meritorious patented articles has been destroyed by the cost of them, but when the patent had expired, and the trade were free to make them, these goods were again put into market and had an enormous sale at lower prices.

Persons must judge for themselves as to what value they put upon their goods, but it would seem sound judgment to so rate them that the million could purchase rather than a few here and there.—*Mechanical Engineer.*

Railway Employés in Australia.

A CORRESPONDENT of the Indian *Railway Service Gazette*, who formerly ran a locomotive in India, writes as follows from Geelong, Victoria:

"I must inform you that the railways here are behind yours in some respects, but not in others. They have got all the best brakes and signals, and they say they have slide-valves that have run 130,000 miles without anything being done to them; but they are behind in their rolling-stock, which are unpleasant to ride in from the continual jolting, and the method they have of working single lines is fraught with danger. They work them on the staff system, and many accidents have happened in consequence thereof. There is nothing like the line-clear message system. As regards labor, there is no chance in Victoria for railway men to find employment. The railway companies bring up their own men, and a first-class body they are. I don't think you could find better anywhere. As a rule they do not work longer hours than men in India, but they don't have shed days, and considering the climate I think those employed on engines here have the best of it. Engineers get from 13 to 15 shillings a day ($3.17 to $3.65); firemen, 9 to 10 shillings ($2.19 to $2.43); but all these have been cleaning in the service and begun before they were twenty-five years of age. They must pass an educational test, be of a certain height, five feet six inches, and of good moral character. All the old hands get compensation—a month's pay for every year in the service—when they retire; and I am told the new hands have to insure their lives upon entering the service. All claims have to be settled by the railway commissioners. Locomotive-men are without a doubt the best paid servants of the State. Sunday work is not known out of Melbourne. A lot of lines do not pay, owing to the sparsely populated country they run through. Don't let any man be foolish enough to come here, if you can help it, to look for work."

Longest Line in Europe.

THERE is only one European railway company with a mileage anywhere near as great as the largest of ours, namely, the Paris, Lyons and Mediterranean, with 4,783 miles; but it has larger earnings than any American system worked under a single management. The largest earnings per mile in France are by the Northern (2,160 miles). These great systems, like ours, include some lines with an immensely heavy traffic and others with very light business, usually embracing all lines in a given district, many of which the companies were required to build, as one of the conditions of their charters. The French-Algerian roads make a very poor showing indeed. The French State railroads, including 1,420 miles of exceptionally unproductive lines, earned $3,281 per mile last year.

The Land Grant of the Texas Pacific Railroad.

THE land grant of the Texas Pacific Railroad lies in Texas and embraces 1,128,000 acres of located land and State warrants calling for 1,300,000 more, making in all 2,428,000 acres. The grant is mortgaged for about $2,200,000, which would be considered a very light lien but for the fact that the land lies in Western Texas, somewhat beyond the agricultural belt; still it ought to average about $1 per acre. The general committee to bring matters to a head is composed of Messrs. Fordyce, Clark, Paramore, Bemis, Kerns, Gilkerson, Wolff, Woerishoeffer and Phillips, with Wolff and Phillips a special sub-committee to work up the details.

French Railway Mileage.

THE length of railway of general interest in operation in France at the close of 1885 was 19,059⅜ miles, as compared with 18,366⅞ miles in working at the close of 1884. It follows that 692½ miles of line were opened for traffic in the course of last year. The length of line of local interest in working at the close of 1885 was 1,106⅞ miles, as compared with 1,001¼ miles at the close of 1884.

DAVIS' SAFETY CAR-TRUCK.

This device, which has been subjected to Two Severe Experimental Tests upon the Canadian Pacific Railway, has proved itself to possess

All the Requirements of a Perfect Safety Truck-Appliance.

In the event of Derailment the Truck remains in its proper position with respect to the Car; and in event of Broken Axles, the Truck-Frames are kept Parallel to the Car.

It can be applied to Freight-Cars of all kinds, to Passenger and Sleeping-Cars, and to Locomotives and Tenders.
A Full Illustrated Description of the Car-Truck appeared in the AMERICAN RAILROAD JOURNAL for October, 1885.
Full particulars will be furnished by addressing

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Two or Four Tracks. Cable Traction.

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To the Westinghouse Air Brake Company, Pittsburgh, Pa.:

GENTLEMEN:—Understanding from your published announcements that you recommend your brake for freight-train use we respectfully invite you to a complete and searching public test of its merits in competition with the *Rote Automatic Brake* This test to be made in so complete and critical a manner as to show all the railroads of the country, as well as the Railroad Commissioners of the various States, which of the two brakes is the one which should be used; for the test will, we are certain, leave no doubt in the minds of any witnessing it.

To insure the proper management of the test we suggest that you choose one person, we another, and these two a third person, all three to be well known as capable and honorable rolling-stock experts, to conduct the test, their expenses to be jointly borne by you and by us.

An invitation to witness the test to be extended to the General Officers of Railroads and all State Railroad Commissioners to the members of the National Car-Builders Association, and to the Railroad and daily press.

The test to be at such time and place as may be mutually agreed upon, but we suggest that the proper place would be on some road having high grades and sharp curves, so that both brakes may have as hard and complete a test as possible. As it is necessary to make the test searching and complete, and as all railroads wish to increase the length of their trains and only wait for a brake which will enable them to do so, we think each train should be made up of 50, 60 or 70 cars, as you may prefer, or, if you think best, of even more cars.

Your company to supply your train and engines, we to supply ours.

The following points, among others, to be considered and reported upon:

Cost of equipping trains.
Simplicity.
Freedom from breakage.
Certainty of action.
Effectiveness.
Cost of maintaining.
"Flatting" of wheels.
Any other points submitted by you or by us in writing to be added to the above.

The brakes or trains are to be tested in every manner and under all conditions which practical railway service may suggest, including yard as well as line service.

Among others the following tests are to be applied to both trains:

1st.—Each train is to be (part of the time) run by engineers and crews who have never operated either brake and who are wholly unfamiliar with them.

2d.—The trains are (part of the time) to be partly made up (as nearly all freights are everywhere) of foreign cars, which have neither your nor our brake on, so that the cars having your break or ours on shall be widely and irregularly separated from each other.

3d.—The locomotives drawing your train and ours to be exchanged, from time to time, and draw each others trains.

4th.—Two locomotives equipped as so many freight engines and tenders are, with hand-brakes instead of steam or air brakes, are to be substituted for the two engines used in the test part of the time. Any brake which will not work properly if this is done, you will admit, can be of little practical value in actual service.

5th.—From time to time each train is to be stopped and foreign cars (not equipped with either your brake or ours) are to be run into it, at irregular intervals, just as actual service requires constantly.

6th.—In the making up of trains, etc., crews are to be exchanged at random, so that the test may fully illustrate the convenience of operating each kind of brake in actual ordinary service.

7th.—Frequent short runs, stops and quick starts are to be made.

8th.—A series of yard tests are to be made, showing the action, convenience, etc., of the two brakes.

We mention a few necessary tests only, and you and we, as well as the test committee, are to add any number of others, it being distinctly understood that if you decline any test proposed by us, or we decline any proposed by you, it shall be condered an explicit and positive admission of inferiority.

This rule must in every case be strictly observed, namely: *Both brakes must be tested in precisely the same manner*, so that there may not only be absolute fairness, but no room for suspicion even of anything else.

You have been in the brake field a long time, have profited justly and largely from the patronage of railroads, and we are sure will welcome this plan for allowing your patrons and the American public to judge for themselves which brake should come into universal use.

Having proper confidence in the merits of your brake we know you will gladly and promptly accept our proposition herein made, as you must feel that the test will be complete.

The railroad public is a very fair-minded, capable body, and will most thoroughly appreciate and fully recognize the equity and fairness of our offer to you, and, in common with business-like people everywhere, will naturally (and, we are sure you will admit, properly) consider it a virtual confession of inferiority and a public admission that the Westinghouse Brake is inferior to the Rote Brake and that it is unfitted for general freight service, should you decline or neglect to avail yourselves of the proposition we make you herein.

Permit us to add in closing that we wish to express to you our desire to have this communication received in the spirit in which it is sent, and to have it express to you our wish for a full, fair and searching test of the two articles in the relative merits of which the railroad interest is *primary* and that of the owners even secondary. Respectfully,

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Per M. D. HARTER, President.

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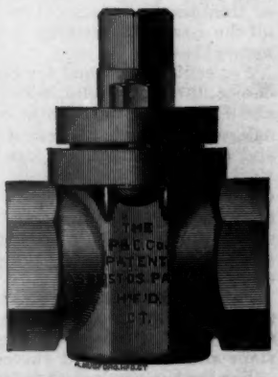

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